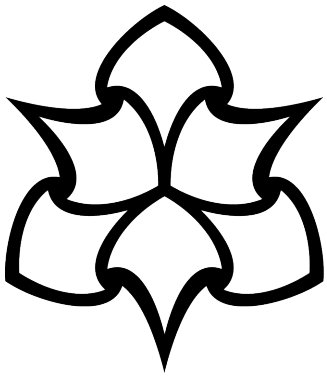

Understanding the motivations, context and content behind non-prescribed benzodiazepine use in the UK: a mixed-methods and cross-disciplinary analysis

A thesis submitted in fulfilment of the requirements of Manchester Metropolitan University for the Degree of Master of Arts (by Research)

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Contents

Abstract

In the recent year, there have been a growing number of news stories highlighting the increased use of benzodiazepines, in particular Xanax, amongst children and young people in the UK. Despite the national governmental and societal concern, there have been very few efforts to research the use and misuse of these drugs. Through quantitative and qualitative social research methods, this mixed-methods, cross-disciplinary thesis presents the findings from a national survey (n=595) exploring the use and misuse of benzodiazepines predominantly amongst the UK student population, and gas chromatography-mass spectrometry (GC-MS) analysis of 29 presumed Valium samples and 29 presumed Xanax samples.

The various motivations included: self-medicating everyday sleep and/or anxiety issues; to sleep on long journeys; to feel more confident in social situations; to feel more confident in presentations and/or exams; to relax; to get high and heighten the effects of other drugs such as alcohol and/or cannabis; to counteract the effects of other drugs such as stimulants (MDMA, cocaine), psychedelics (acid, LSD) and/or study drugs (Modafinil/Ritalin); to avoid or dilute the negative emotional and physical side effects of hangovers and/or comedowns. To correct irregular sleep patterns, eradicate or ease physical pain. Ease of access, availability and low cost was acknowledged as a significant motive for some, especially when other substances were unavailable. Many highlighted the weak efficacy of NHS treatment services as a reason for self-medicating, and policy makers are urged to invest more into treatment services. However, negative side effects were also noted such as feeling overly sedated which impaired complex psychomotor tasks like driving; feeling hungover; the impairment of memory and black-outs; accidents and injuries; emotional blunting and depression; tolerance, dependency and withdrawal and; mortality. Benzodiazepines often made users feel '*invincible*' and that usage lead to irrational and erratic behaviour: Some reported shoplifting, breaking into places, purposefully breaking things, driving and crashing their car whilst intoxicated, getting into fights, and/or physically attacking people.

GC-MS analysis revealed that the 'Xanax' samples (thought to contain 2 mg of Alprazolam) ranged from 0.70 – 2.21 mg and the 'Valium' samples (thought to contain 10 mg of Diazepam) ranged from 12.97 – 26.79 mg. Six of the 29 'Xanax' samples did not contain any active Alprazolam and of those, two were cut with other research chemicals. One 'Valium' tablet did not contain any active Diazepam.

Glossary

‘Anxiolytics’ – A drug used to relieve anxiety.

‘Benzodiazepines’ – CNS depressant drugs used to assist in the management of anxiety and panic disorder and sleeping problems.

‘CNS depressants’ – A family of drugs which slow down vital bodily functions in the CNS, like breathing and heartbeat.

‘Counterfeit’ – A custom-pressed substance which is not of true content. Counterfeits often contain less active ingredient, more active ingredient or other adulterants and bulking agents.

‘Drugs’ – Any substance, be it prescribed or non-prescribed, which alters the chemical levels in the brain and body. This can range from prescribed anti-anxiety medication like Diazepam to illicit drugs such as MDMA or Cocaine. This includes alcohol.

‘Functional users’ – This category is similar to above, however there are some cases of ‘problematic’ drug users who are still able to function well within society. These individuals are also dependent on the substance they are taking. These can range from individuals taking the same prescribed psychotropic medication every day for numerous years to individuals self-medicating with illicitly bought Ketamine every day for years.

‘Medicinal’ – Drugs which are used medicinally are used enhance an individual who is low in mood or who is physically ill. This can range from taking Diazepam (prescribed or non-prescribed) to eliminate feelings of anxiousness, to drinking a glass of wine in the evening to relax. This category and ‘problematic’ have a fine line in between the two, as it is easy to fall into problematic use.

‘Misuse’ – Drugs which are used for a longer period than recommended or those that are taken in higher dosages than recommended. Drugs which are used in conjunction with other drugs, in order to potentiate the effects.

‘Poly-drug use’ or ‘poly-substance use’ – When two or more drugs are taken together. This includes alcohol.

‘Recreational’ –Drugs which are taken in order to have a good time. This can range from binge drinking alcohol when celebrating a friend’s birthday, to having a line of Cocaine when clubbing.

‘Sedatives’ – Drugs that suppress anxiety and promote sleep.

‘Stimulants’ – A class of drugs that stimulates the activity in the brain, increasing heart rate, blood pressure and respiration.

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Chapter One: Introduction and thesis overview

1.1 Introduction

Patented in the 1960s, benzodiazepines are certainly not a new family of drugs. Users have ranged from anxious mothers to problematic heroin addicts over the decades (Susann, 1966; Stitzer et al., 1981; Jones et al., 2012). However, in recent years, there has been a clear shift from the traditional 'problematic' adult drug user to a more specific focus on a new user group. UK media headlines have been populated with reports of teen Xanax misuse, some stating children as young as 11 are taking the anti-anxiety medication (see BBC News, 2018a; BBC News, 2018d; Birmingham Mail, 2018; The Guardian, 2018c; VICE, 2018a).

The popular young culture and lifestyle magazine *VICE* recently ran a series of articles, created a short film and launched a nationwide survey via social media in a bid to highlight the misuse of Xanax amongst teens (see VICE Channel: Xanxiety; VICE, 2018b; VICE, 2018c). Additional media headlines suggest young people are illicitly sourcing benzodiazepines in order to self-medicate for any underlying mental health issues (see BBC News, 2015; ITV News, 2018a; Metro, 2018; Mirror, 2018; The Guardian, 2018b; The Guardian, 2018d; The Telegraph, 2018; VICE, 2018a). However, it must be noted that online journalist publications have the tendency to sensationalise and exaggerate stories (Kitzinger, 1999) and dominantly focus on negative accounts (Taylor, 2008). Indeed, there has been a long history of drug-related moral panics (see The New York Times, 1990 on crack babies; The Independent, 1996 on Leah Betts). Thus, concerns are raised regarding the reliability and validity of the reports (Joo Chung et al., 2012). In summary, the current discourse on the use of benzodiazepines amongst young people in the UK is dominated by media reports and is lacking in more robust academic knowledge. The research that follows sets out to readdress this imbalance by providing an interdisciplinary study of benzodiazepine use and source and supply. In doing so, it provides a valuable and timely contribution to existing knowledge and understanding of an emerging drug trend.

Leaving the potential for media exaggerations and moral panic aside, the most recent Home Office report revealed an approximate 63,000 person increase of non-prescribed tranquiliser use amongst adults in England and Wales within the last year (Home Office, 2018). Figures of usage within the last year have risen amongst 16 – 24 year olds since 1993, from 8.4% to 9.1% in males and from 19.2% to 26% in females (ibid). However, CSEW data is usually collected from the head of the household, and fails to capture the student and young professional population, typically living away from the

parental home. Moreover, the term 'tranquiliser' is broad, and benzodiazepines such as Xanax and Valium may only account for a small fraction of the data.

The popularity of Xanax is evident in many ways. When typing 'Xanax' into *Etsy* and *EBay*, 242 and 656 items come up respectively (searched on 15th November 2018), ranging from engraved rings and necklaces to framed artistic prints (see appendix 1 and 2 for screenshots). Social media and celebrity culture has undoubtedly played an important role in what could be viewed as the 'normalisation' of benzodiazepine use (see Manning, 2007). Cultural accommodation and the popularity of benzodiazepines amongst celebrities and music artists will be discussed in section 2.4.2.

Several international research papers have thoroughly scoped out the nature, prevalence and possible motivations for the non-medical use of prescription drugs (see Karam et al., 2000; McGabe, 2005; Bardhi et al., 2007; Rigg and Ibañez, 2010; LeClair et al., 2015; Weaver, 2015; Beharry and Gibbons, 2016; Andersson and Kjellgren, 2017; Mateu-Gelabert et al., 2017) and one study even suggested that the UK had the highest amount of non-medical prescription drug users in Europe (see Novak et al., 2016). However, it is believed that there is currently only one published academic paper examining the nature and prevalence of the use and misuse of hypnotics and anxiolytics solely in the UK (see Kapil et al., 2014). However, as well as being severely outdated, the sample size is small: the total number of participants is stated to be 1500, however, only 392 reported having tried at least one benzodiazepine or Z-drug and merely 116 reported to have 'misused' them. Therefore, it cannot explain the recent spike in young people. In addition, the research paper incorporated the misuse of Z-drugs.

Kapil et al.'s 2014 study also revealed that the majority of users obtained their benzodiazepines via legitimate or diverted prescription. Almost five years since the report was published, it can be assumed that the usual source of benzodiazepines has differed and that usage has escalated due to the growth of online drug markets. The online world has undoubtedly facilitated the growth and expansion of drug use due to dark- and clear-web markets, allowing small inconspicuous packages to be shipped globally at a relatively low cost (Barratt and Aldridge, 2016; Dittus et al., 2018) and it is assumed that the recent spike in Xanax use in the UK is an immediate reflection of this (elaborated in section 2.5). However, little is known about the source and supply and thus, this research project wishes to explore this further.

Although the current research project wishes to explore the *illicit* use of benzodiazepines, even when following the recommendations of 'proper' use, it does not mitigate the development of problems. The adverse negative effects of the use and misuse of pharma-grade benzodiazepines

have been acknowledged for many years and present numerous life-threatening risks. Alongside their highly addictive potential (Hollister et al., 1961; Covi et al., 1973; de las Cuevas et al., 2003), benzodiazepines may also create paradoxical stimulation such as heightened anxiety, hyperactivity, and fury (Gardner and Cowdry, 1985; O'Sullivan et al., 1994; Paton, 2002) which sometimes results in erratic, violent behaviour (Ashton, 2002). For many years, they have been known to have powerful memory wiping effects (Bond et al., 1991; Griffin et al., 2013; Ford and Law, 2014) which may persist in the long-term (Curran, 1986; Curran et al., 1994). Their powerful sedative properties have proven to significantly impair everyday tasks (Kozená et al., 1995; Verster et al., 2002), and can lead to serious accidents (Friedman, 2006; Ravera et al., 2011). Deaths involving benzodiazepines have risen by 90% in the last decade (from 207 in 2007 to 391 in 2017), and Diazepam deaths have seen a 5-fold increase since 1993 (from 52 in 1993 to 226 in 2017) (Office for National Statistics (ONS), 2018). Their powerful CNS depressant properties increase the risk of mortality for those who exceed the recommended dosage and/or use them in conjunction with other depressant drugs like alcohol and ketamine (World Health Organisation (WHO), 2016). However, former studies highlighting the negative side effects are based upon the use and misuse of prescribed, legitimate benzodiazepines. Little is known about the desired and undesired side effects when they are used off-prescription, and the effects of street-bought benzodiazepines.

In the past few years there have been numerous cases of hospitalisation after use: the BBC discovered that the North East Ambulance Service responded to 240 call-outs in 2017 alone, treating children aged 11 – 18 for Xanax misuse (BBC, 2018a). In June 2016, five teenagers were hospitalised in Sidmouth after taking Xanax alongside consuming alcohol (Sidmouth Herald, 2016); in early 2018, six young girls were rushed into A&E after taking too many Xanax bars during lunch time at school (Evening Standard, 2018); a further six needed treatment in Brighton and Hove (BBC News, 2018b) and; 20 teenagers were once collectively hospitalised in Salisbury after taking the drug (BBC News, 2017a; ITV News, 2017). With the scaremongering media strongly focusing on cases of hospitalisation and in the absence of up to date academic research on use in the UK, we are left with little credible evidence and limited understanding of this apparent rising drug use trend.

Almost double the amount of young people in England are accessing treatment services for benzodiazepine-related problems since last year (from 161 (2016 – 2017), to 315 (2017 – 2018)) (Public Health England, 2018). Specifically, those accessing treatment services who have issues with Xanax has increased 6-fold within the last year (from 8 (2016 – 2017) to 53 (2017 – 2018)) (ibid.). Another compelling concern with non-prescribed benzodiazepines users is the lack of structured

guidance and knowledge that would usually come from prescription packets and general practitioners. This may lead to more adverse negative reactions.

An important and alarming consideration of the non-prescribed use of benzodiazepines, particularly in the UK context where Xanax is unobtainable via NHS prescription, is the likelihood that street Xanax is not of pharmaceutical standard. Recently, the UK media reported Xanax bought via social media was cut with Etizolam (BBC News, 2018), boric acid, rat poison, floor polish, and pesticides (Daily Mail, 2018). In Scotland, reports showed counterfeited street 'Diazepam' had been laced with benzodiazepine analogues Diclazepam, Etizolam and Flubromazepam, and synthetic opioid U-47700 (Police Scotland, 2016). A major cause for concern is the presence of fentanyl-laced Xanax in the US (see CBS News, 2016; Fox News, 2018), and the possibility of it penetrating the UK scene. Consuming adulterated benzodiazepines can cause death by adverse drug interactions (Jackson et al., 2011) and health care professionals would not know how to treat any harrowing symptoms. There is a dearth of knowledge regarding any side effects from non-prescribed and potentially adulterated benzodiazepines, which will be explored throughout this thesis. Chapters Five and Six this research project will display the methodology and results from the analytical science in order to determine the true contents and purity levels of popular street samples such as 'Valium' and 'Xanax'.

To summarise, our current and existing academic knowledge about benzodiazepine usage and context is outdated, lacks generalisability and does not solely focus on the UK population. The somewhat unreliable media dominated discourse means there is little empirical evidence and it lacks in-depth analysis of the rising phenomenon. It is unknown as to where non-prescribed users source their benzodiazepines, and the content of what they are consuming. The following section will outline the research aims and objectives.

1.2 Research aims and objectives

Without reliable, generalisable, up to date, in-depth data examining the context of and the motivations behind benzodiazepine use in the UK, it is impossible to understand the rising phenomenon and consequently prevent risks and dangers. Thus, a mixed methodology incorporating a web-based survey inclusive of open- and close-ended questions alongside semi-structured face-to-face interviews were used to efficiently collect data from past and current benzodiazepine users in the UK, with the intent to explore:

- Which benzodiazepines are popular?
- Who is taking benzodiazepines?
- What are the motivations for use?
- What are the effects (both desired and undesired) of benzodiazepine usage?
- Where do users source their non-prescribed benzodiazepines?
- What factors influence benzodiazepine users' decisions on what benzodiazepines they use and where they obtain them?

The chemical analysis element of this project wishes to explore:

- What are the true contents of illicitly sourced benzodiazepines?
- Are street-bought 'Valium' tablets safer than 'Xanax' bars?

The knowledge that this research project sets out to gather will be utilised to support an evidence based harm reduction approach to inform users, substance use practitioners and other relevant stakeholders of potential risks from misuse, including poly-substance use.

1.3 Thesis structure

The thesis is divided into seven chapters. Following on from this introduction chapter, the remaining chapters are as follows:

Chapter Two will review the existing literature and draw upon national and international research papers alongside UK media coverage in an attempt to illustrate the current knowledge of non-prescribed benzodiazepine use. It will begin by outlining the pharmacodynamics and pharmacokinetics of benzodiazepines, in particular: Diazepam (Valium) and Alprazolam (Xanax). Then, the history and evolution of benzodiazepines over the years and the respective user groups will be explored before examining the current media discourse in the UK. Ease of access, availability

and the cost of benzodiazepine drugs will be highlighted before examining the variety of possible motivations for usage. International research papers provide a broad variety of motivations for non-prescribed benzodiazepine users, however, the UK just has one published research paper which consists of a small sample size and is outdated. Thus, UK user demographics and usage trends are based dominantly on media coverage. Chapter Two will end with a list of acknowledged adverse negative effects stemming from the use and misuse of benzodiazepines.

Chapter Three will outline the social science research methods used for this project. It will begin by justifying the use of mixed methods in order to efficiently collect and analyse quantitative and qualitative data regarding individuals' benzodiazepine use and misuse. It will then outline the quantitative and qualitative element respectively, specifically: a discussion of ethics; sampling and recruitment; survey distribution methods and; data analysis. The survey link was actively distributed and promoted between 1st March 2018 and 24th April 2018, and the survey was closed on the 8th June 2018. A wide range of online and offline distribution methods alongside inside knowledge of young people's social media habits enabled rich data collection from 595 participants. Using *Facebook* to target the student population and *Twitter* to target academics proved to be a great way to access nationally dispersed participants. Chapter Three will end by reflecting on the methodology used and the limitations of the approach.

Chapter Four will present the findings from the social science research element of this project. Following the layout of Chapter Two, it will begin with stating participants' demographic information before highlighting the two dominant benzodiazepines used: Valium and Xanax. It will then go on to examine the ease of access, availability and the cost of both benzodiazepines, before presenting the wide range of user motivations, specifically: using them to aid sleep; self-medicating anxiety-related issues and/or to boost confidence; to get high, mostly in conjunction with other drugs; to counteract other drug effects and; to avoid hangovers and/or comedowns. Dosage and routes of administration were closely linked to user motivations which will be discussed throughout this chapter. It will then touch upon substance use replacement as an explanation for the recent spike in usage before presenting personal opinion of benzodiazepine preference, which often contradicted one another. Chapter Four will end by highlighting participants' accounts of adverse negative effects on the brain and behaviour.

Chapter Five will provide details of the methodology created and implemented in order to carry out the forensic testing of 29 presumed 'Valium' and 29 presumed 'Xanax' samples. It will begin by examining the scale of the illicit benzodiazepine market. It will then outline the issues with counterfeits, specifically: drugs laced with other, more harmful adulterants; those with a higher

concentration of the active ingredient and thus, increased purity and; those with less active ingredient. It will then examine the evolution of substance testing in the UK and its significance. The chapter will then outline the methodology created to perform chemical analysis to determine the content and purity of 29 seized 'Valium' samples and 29 seized 'Xanax' samples from Greater Manchester. The first half of the methodological chapter will outline the presumptive test used and the results, followed by methods of nuclear magnetic resonance (NMR) and the results. It will outline the gas chromatography-mass spectrometry (GC-MS) testing element, specifically: the GC-MS settings used; the preparation of the eicosane stock solution; the preparation of the reference and calibration standards and; the unknown sample preparations.

Chapter Six will present the findings from the quantitative and qualitative analysis of the 29 assumed 'Xanax' bars and the 29 assumed 'Valium' tablets seized in Manchester. All samples ranged significantly in concentration. A small handful contained no active ingredient and some contained other adulterants.

Chapter Seven, the final chapter, will provide a discussion regarding the contribution to knowledge and how this new data can be used to inform policy makers; mental health service providers; substance misuse organisations and charities and; current users. It will draw upon the key findings using existing and new knowledge in order to minimise harm and fatalities stemming from benzodiazepine use and misuse.

Chapter Two: Literature Review

2.1 Introduction and chapter overview

This chapter will begin by outlining the pharmacological profile of benzodiazepines, specifically: the mechanism of action (section 2.2.1); pharmacodynamics (section 2.2.2) and; the individual pharmacokinetics of Diazepam (Valium) (section 2.2.3.1) and Alprazolam (Xanax) (section 2.2.3.2). Section 2.3 will explore the evolution of benzodiazepine in a historical context, before section 2.4 reviews the current knowledge in the UK as portrayed by popular media publications, specifically: the perceived demographics of users (section 2.4.1) and the drugs' representation in celebrity and music culture (2.4.2). Section 2.5 will highlight the ease of access of benzodiazepines, specifically: using the clear-web and social media (section 2.5.1) and; the dark-web (section 2.5.2). Section 2.6 will examine the possible motivations for benzodiazepine users by drawing upon international studies alongside the one UK-based study, specifically: perceived risk and social acceptance (section 2.6.1); to treat sleep issues or insomnia (section 2.6.2) and/or; self-medicating anxiety issues (2.6.3). The following sub-section will explore recreational uses such as: relaxation (section 2.6.4.1); to get high (section 2.6.4.2) and/or; using them to come down from stimulant drugs (section 2.6.4.3). Section 2.7 will highlight the already acknowledged adverse negative effects: temporary sedation, complex psychomotor tasks, accidents and injuries (section 2.7.1); memory impairment and cognitive decline (section 2.7.2); paradoxical stimulation (section 2.7.3); emotional blunting and depression (section 2.7.4); poly-drug use dangers (section 2.7.5) and lastly; tolerance, dependency and withdrawal (section 2.7.6).

2.2 Benzodiazepine pharmacology

Before examining the evolution of benzodiazepines and how user demographics and motivations have significantly altered over the years, it is necessary to outline exactly what benzodiazepines are and how they pharmacologically compare in order to chart their popularity. The following sections will outline the general pharmacology of benzodiazepines: how the drugs act on the brain (section 2.2.1) and behaviour (section 2.2.2). Section 2.2.3.1 will outline the correct use and appearance of Diazepam (Valium), and section 2.2.3.2 will explore Alprazolam (Xanax) and how their use is justified as an effective relief for those suffering with anxiety and/or insomnia, before the two popular benzodiazepines are compared (section 2.2.3.3).

2.2.1 Mechanism of action

Anxiety and panic disorder are diverse and complex mental health issues (Gale and Oakley-Browne, 2004), whereby a sufferer may experience an accelerated heartbeat, cold sweats and be disorientated (Dunn, 2016; Moran, 2017). To combat this, the natural inhibitory neurotransmitter gamma-aminobutyric acid (GABA) acts by reducing the excitability of neurons, thus creating a feeling of tranquillity in the brain (Kerr and Ong, 1995). By enhancing the activity of GABA at the $GABA_A$ receptor complex, benzodiazepines potentiate these senses, allowing the user to feel an influx of mental and physical relaxation (Carter et al., 2010). With the correct dosage and administration, benzodiazepines are able to cause positive calming affects to nearly every area of brain function (Lader, 2011). The psychotropics possess anxiolytic, sedative, hypnotic, muscle relaxant, anticonvulsant and amnesic properties, alongside being effective during alcohol withdrawal (Amato et al., 2010; Lader, 2012; Ford and Law 2014).

2.2.2 Pharmacodynamics

With the ability to cause effect on nearly every part of brain function, the *spinal cord* is just one of the sites of action of benzodiazepines, alongside the *cerebellum*, the *brain stem*, the *cerebral cortex*, and the *limbic system* (Rudolph et al., 1999; Lader, 2011; Ford and Law, 2014).

The *spinal cord* and the *cerebellum* are responsible for the physical effects to the body. After administering the drug, the individual experiences relaxation in the muscles and posture, alongside a more rational and composed coordination of movement and a more stable balance (Ford and Law, 2014). However, potential for misuse runs parallel to an increase of age, dosage, poly-drug use and in particular; the addition of alcohol (Maxwell et al., 2010). Users may feel mild physical sedation, unsteadiness and disorientation with effects lasting in the long-term (Block and Berchou, 1984; Baldwin et al., 2013; Griffin et al., 2013).

The *brain stem* controls vital functions such as the regulation of the heartbeat, breathing and blood pressure (Nicholls and Paton, 2009). These are all significantly slowed down with the addition of a benzodiazepine (Bandelow et al., 2017), enabling a great sense of relief when combatting the first signs of panic and fret (Stahl, 2002). However, increased dosage and taking them in conjunction with other CNS depressant drugs like alcohol, ketamine, cannabis or opioids can be fatal (National Institute on Drug Abuse, 2011; Schmitz, 2016; WHO, 2016): an individual's heartrate may be suppressed to such an extent that it stops completely.

The *cerebral cortex* is also affected: cognitive abilities are slightly fractured, levels of consciousness are altered and the user will become drowsy alongside losing the ability to maintain full concentration levels. Long-term benzodiazepine use has proven to have significant, detrimental effects on a users' speed of processing, problem solving abilities, verbal memory skills and attention span (Block and Berchou, 1984; Barker et al., 2004; Michael et al., 2007).

Lastly, benzodiazepines can cause direct effect to the *limbic system* (Rudolph et al., 1999), also known as the '*emotional brain'*, alongside effecting the mesolimbic dopamine system, whereby the drug has the power to dull down negative emotions such as fear and anxiety (Ford and Law, 2014). Even though these effects may abolish crippling anxiety, paradoxical effects may arise with prolonged use and increased dose, leading to feelings of emptiness, dysphoria or agitation and rage (Hollister et al., 1961; Ashton, 2002; Paton, 2002; Lader, 2012).

Adverse negative effects will be elaborated further in section 2.7.

2.2.3 Pharmacokinetics: individual clinical actions and their efficacy

Pharmacokinetic properties show great diversity. Benzodiazepines can range from short- to extremely long-acting and subsequently their efficacy relies on the distribution, absorption, metabolism and excretion of the drug (Muscatello et al., 2012; Griffen et al., 2013). These shape the onset of action and the duration of effect, and must be considered with intricate detail before administration in order to reach the best potential of each drug and avoid any negative side effects. Typically, there are three different types of onset: short-acting (half-life = <5hrs); intermediate-acting (5-24 hrs) and; long-acting (>24hrs). Short- and intermediate-acting benzodiazepines are favoured when treating insomnia, whereas long-acting benzodiazepines are preferably administered when seeking to diminish levels of anxiety or panic (Ford and Law, 2014; Dikeos et al., 2008). It must be noted that benzodiazepine analogues[1] such as Etizolam, are particularly confusing for health care practitioners when attempting to treat unwanted side-effects and producing tapering plans.

Generally speaking, benzodiazepines share relatively similar pharmacodynamic properties, however it must be noted that the levels of potency of each drug differs immensely (Griffin et al., 2013) and individual genetically determined activity of specific drug metabolising enzymes impacts users differently (Ashton, 2011). Using information from previous research papers and recommendations: Ashton (2002), Griffin et al. (2013), Ford and Law (2014) and the Ipswich and East Suffolk Clinical

[1] Benzodiazepine analogues mimic the effects of benzodiazepines but differ in chemical structure

Benzodiazepine agonist drug	Intended use	Equivalence to 5 mg Diazepam	Speed of onset	Peak onset (hrs)	Duration of action	Half-life (hours)[2] [active metabolite]
Alprazolam (Xanax)	Anxiety	0.25 mg	Intermediate	1 – 2	Short-acting	6 – 27
Chlordiazepoxide (Librium)	Anxiety, alcohol withdrawal	12.5 mg	Slow	2 – 4	Long-acting	5 – 30 [36 – 200]
Clonazepam (Klonopin)	Anxiety, epilepsy	0.25 mg	Intermediate	1 – 2	Long-acting	18 – 50
Diazepam (Valium)	Anxiety, insomnia	5 mg	Rapid	1	Long acting	20 – 100 [36 – 200]
Etizolam		0.5 mg	Rapid	0.5 – 2	Short-acting	
Lorazepam (Ativan)	Anxiety, insomnia	0.5 mg	Intermediate	1 – 6	Intermediate-acting	10 – 20

Commissioning Group (2016), the table below compares common benzodiazepines with regards to potency, speed of onset, peak of onset, duration of action, half-life and intended use.

Table 1: Common benzodiazepines compared

The following sub-sections will explore the two most common benzodiazepines more in-depth: Diazepam (Valium), and Alprazolam (Xanax) – the most commonly used by survey respondents (see Chapter Four: section 4.3). These were also considered to be the popular benzodiazepines based on prescription statistics and their mentions in medical literature, US rap culture on UK media headlines (see section 2.4).

[2] Half-life: the time taken for the blood concentration to decrease by half

2.2.3.1 Diazepam (Valium)

Labelled as the 'wonder drug' when it was first patented (McGee, 2003), Diazepam, also known as Valium, was one of the first benzodiazepines which replaced the barbiturates as it was believed to be more effective and initially showed no addictive potential whatsoever (Lader, 2011; Wick, 2013). It has been sold in the UK since 1963 to treat symptoms of anxiety, insomnia and acute alcohol withdrawal. Usual dosages initially begin at 2 mg administered 3 times a day, which may be increased up to 15 – 30 mg (per day) if necessary. Those suffering with insomnia may be prescribed from 5 mg up to 15 mg daily, to be taken in the evening (National Institute for Health and Care Excellence (NICE), 2018).

Diazepam enters the central nervous system quickly with a peak onset of 1 hour. It is also known to cause anticonvulsant and myorelaxant effects, and has a long half-life of 20 – 100 hours (see Table 1 above). Diazepam carries a unique characteristic whereby its metabolism in the liver creates the active metabolites Temazepam, Oxazepam and Desmethyldiazepam (Griffin et al., 2013), which contribute to the drugs long elimination half-life of up to 4 days (Baldwin et al., 2013; Griffin et al., 2013; Ford and Law, 2014). Thus, individuals may feel the sedative and muscle relaxant effects a few days after consumption (ibid), which increases the risk of accidents and injuries. However, Mak et al. (1993) discovered that although Diazepam carries sedative properties, users do not experience significant respiratory depression.

Valium tablets are available in different dosage strengths: 2 mg (white, round), 5 mg (yellow or orange, round), and 10 mg (blue or green, round). The blue 10 mg tablets are most commonly used by non-prescribed users (see Drugs Map of Britain: Scotland's Valium Crisis, 2016). See appendix 3 for images.

2.2.3.2 Alprazolam (Xanax)

Released by the pharmaceutical company *Upjohn* (now known as *Pfizer*) in 1981, Alprazolam, also known as Xanax, is a potent, short-acting anxiolytic which was first recognised as sufficiently treating panic disorder (Chouinard et al., 1983; Ballenger et al., 1988). It is commonly prescribed in America for the short-term use in anxiety and acute alcohol withdrawal and in 2013, over 48 million prescriptions were dispensed making it the most commonly prescribed psychotropic across the nation (Grohol, 2018).

Alprazolam has an intermediate speed of onset and peak effects are recognised after 1 – 2 hours. It is shorter-acting than Diazepam, with a half-life of 6 – 27 hours (see Table 1 above) and is therefore

preferred for individuals seeking fast relief of intermittent spells of anxiety and panic disorders (Alexander and Alexander, 1986; Jonas et al., 1993). However, its magnificent reinforcing effects increase the potential for over-use and due to its short elimination half-life, users must be aware that they may experience crippling rebound anxiety when halting the medication abruptly (Tesar, 1990; Griffin et al., 2013).

Although it is not available under NHS prescription in the UK, Xanax is readily available via private prescription and other, illicit sources (elaborated in section 2.5). Without correct harm reduction information, non-prescribed users are generally unaware of the drug's pharmacological profile and the potential for misuse is much greater (Ashton, 2011). Moreover, illicitly sourced drugs are frequently adulterated with other and sometimes harmful substances (Liang, 2006; Cole et al., 2010). The impact of encountering counterfeit pharmaceuticals will be explored further in Chapter Five: section 5.1.3. The commonly held perception that Xanax and other benzodiazepines in the UK are non-pharma produced has influenced the chemical analysis element of the research design. The forensic testing methodology and rationale will be presented in Chapter Five after which results will be presented in Chapter Six.

The dominant dosage of Xanax populating current media headlines refers to the 2 mg Xanax bars (white, rectangular). Other dosages include 0.25 mg (white, oval or round), 0.5 mg (orange, oval), 0.5 mg (peach, round), 1 mg (blue, oval), 1 mg (blue, round), 2 mg (white, round) and 2 mg (yellow, rectangular). All images can be found in appendix 4.

2.2.3.3 Comparing the two

Unlike Diazepam, Alprazolam has a short elimination half-life, and is much more potent. When comparing the chemical properties of the two, 5 mg of Diazepam equates to approximately 0.25 mg of Alprazolam (see Table 1 displayed above). The latter has a much quicker onset of action, a much more powerful effect and leaves the system quicker, resulting in the feeling of reinforcement being much greater. However, speed of onset has also been directly linked to levels of reinforcement (O'Brien, 2001, cited in Compton and Volkow, 2006). Compared to Alprazolam, Diazepam has a faster speed and peak of onset and thus, also has high levels of reinforcement and abuse potential.

2.3 The evolution of benzodiazepines and shift in user demographics

Post World War 2, chemists began to discover mind-altering drugs which could be administered during therapy (Tone, 2005). Replacing the formerly loved barbiturates (Lader, 1991), benzodiazepines were found to accelerate the production of GABA in the brain and subsequently create feelings of tranquillity and ease. These drugs initially showed little psychological or physical risk to users (Jonas et al., 1993; Lader, 2011; Wick, 2013; Ford and Law, 2014), and low addiction potential (Committee on the Review of Medicines (CRM), 1980). Benzodiazepines grew popular as their anxiolytic, anticonvulsant, hypnotic and muscle-relaxant properties were favoured to assist in the management of anxiety, panic disorder, insomnia and epilepsy (Chouinard et al., 1983; Ballenger et al., 1988; Wick, 2013).

The expeditious growth of the benzodiazepine family had precise correlation with international prescription statistics: In 1978, the pharmaceutical company *Hoffman La-Roche* sold enough Valium pills to sedate half of the world's population (Times Colonist, 2003, cited in Tone, 2005). Around the year 1991, it was believed that 15% of all NHS prescriptions were for hypnotics and anxiolytics (Lader, 1991). At first, it was perceived that users were middle-class, worried mothers and wives (The New York Times, 2012; Woods, 2016): 1 in 20 UK prescriptions were for Valium, predominantly for women (The Independent, 2003). In Jacqueline Susann's 1966 novel *Valley of the Dolls*, she wrote about troubled, middle-class women who wished to relieve everyday stresses and then became dependent on prescription medication. In the same year, *Mother's Little Helper* was a chart hit by The Rolling Stones, reiterating the belief that benzodiazepines were dominant amongst anxious mothers and wives post World War 2:

> *'Kids are different today', I hear ey'ry mother say*
> *Mother needs something today to calm her down*
> *And though she's not really ill*
> *There's a little yellow pill*

(The Rolling Stones, 1966)[3]

[3] Referring to the 5 mg yellow Diazepam tablets: see appendix 3

The use of small psychoactive tablets to help maintain a stable mind became fairly normalised (New Internationalist, 1984; The New York Times, 2012; National Institute on Drug Abuse (NIDA), 2011) however their addictive potential soon presented itself (de las Cuevas et al., 2003) alongside other harmful side effects such as: damaging memory functions; the impairment of psychomotor tasks leading to accidents and injuries; paradoxical stimulation and; emotional blunting (Block and Berchou, 1984; Curran, 1986; Kozená et al., 1995; Paton, 2002; Barker et al., 2004; Michael et al., 2007; Maxwell et al., 2010; Billioti de Gage et al., 2012). By the 1970s, it became apparent that users could become dependent and show signs of withdrawal even after normal dosages (Hollister et al., 1961; Covi et al., 1973). Thus, the Committee on the Safety of Medicines issued a report in 1988 recommending that usage should not exceed 2-4 weeks (see Committee on the Safety of Medicines, 1988). Addiction charities emerged such as the Bristol and District Tranquilliser Project (established in 1985) and Mind in Camden: REST Service (established in 1988) however campaigns to halt benzodiazepine production were seemingly ignored and many more of the psychotropic drugs were patented throughout the years (Lader, 1991), as displayed in the table below.

Generic Name	**Brand (Manufacturer)**	**Sold since**
Chlordiazepoxide	Librium et al. (*Roche*)	1960
Diazepam	Valium et al. (*Roche*)	1963
Nitrazepam	Mogadon et al. (*Roche*)	1965
Oxazepam	Serenid (*Wyeth*)	1966
Lorazepam	Ativan et al. (*Wyeth*)	1972
Clorazepate	Tranxene (*Boehringer*)	1973
Flurazepam	Dalmane (*Roche*)	1974
Temazepam	Euhpnos (*FCE*), Normison (*Wyeth*)	1977
Triazolam	Halcion (*Upjohn*)	1979
Bromazepam	Lexotan (*Roohoo*)	1982
Alprazolam	Xanax (*Upjohn*)	1983

Table 2: Examples of benzodiazepines and their year of introduction to the UK

Despite Alprazolam being around since 1983, it was not the benzodiazepine of choice in the UK until recently. The growth of online clear- and dark-web markets and the ease of access may be a potential explanation for this development which will be discussed further in section 2.5.

Slowly, user demographics shifted from middle-class individuals seeking harmless relief in order to cope with everyday stress, to opioid users seeking to enhance levels of toxicity (see Stitzer et al., 1981; Jones et al., 2012; Schmitz, 2016). Counterfeit pharmaceuticals and benzodiazepine-type NPS' began to emerge (United Nations Office on Drugs and Crime (UNODC), 2017), smothering the dark market and enabling users to obtain various benzodiazepines quickly and cheaply (Barratt and Aldridge, 2016; European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), 2016a; Dittus et al., 2018). The former 'wonder drug' Valium was accountable for 285 deaths in England and Wales in 2016 (ONS, 2018).

The most recent years have seen growth in another group of users in the UK: children and young people. Despite almost 50 years since being discovered and levels of Diazepam prescriptions remaining fairly stable at around 4 – 5 million issued in England and Wales per annum (OpenPrescribing.net, 2018), there are still significant gaps in knowledge as to how they are used off-prescription. The following section will examine media coverage and literature highlighting the nature of current benzodiazepine use and seek to determine possible motivations for use.

2.4 Current media discourse in the UK

As stated in Chapter One of this thesis, trade names Xanax (Alprazolam) and Valium (Diazepam) have been prominent buzz words in recent UK headlines, with reports of increased usage amongst children and young people (see BBC News, 2018a; BBC News, 2018d; Birmingham Mail, 2018; VICE, 2018a). After an extensive search on LexisLibrary online from the past 2 years (14th September 2016 – 14th September 2018), the term 'Xanax' featured 1,221 times in 125 UK newspapers and the word 'Valium' alone had featured 2,429 times. Coupled with 'young people', 133 news articles were presented when associated with 'Xanax'. See the table below for other combinations.

Term	**Number of different sources**	**Number of mentions**
'Xanax'	126	1,221
'Valium'	215	2,429
'Benzos'	43	188
'Xanax' and 'self-medicate'	10	33
'Valium' and 'self-medicate'	20	35
'Xanax' and 'young people'	42	133
'Valium' and 'young people'	36	104

Table 3: LexisLibrary search from 14th September 2016 – 14th September 2018: UK Newspapers only

The table above shows that Valium has been more prevalent in media headlines in the past two years than Xanax. Revisiting the UK study in 2014, the dominant benzodiazepine discussed was also Diazepam (n=62, 53.4%), followed by Lorazepam (n=26, 22.4%), Alprazolam (n=20, 17.2%), Oxazepam (n=14, 12.1%) and Nitrazepam (n=12, 10.3%).

The media discourse as displayed in table 3 above suggests that Valium is still the most frequently discussed benzodiazepine and perhaps the most frequently used, however reliable, up to date,

academic evidence is lacking to confirm this continuation, thus, this research project wishes to fill that gap. This research project wishes to explore the truth behind media coverage, and discover which benzodiazepine has been used more frequently from a user perspective.

Section 2.4.1 will explore the perceived demographics of benzodiazepine users based on investigative journalist pieces, government reports and the one academic study (Kapil et al., 2014). The popularity of Xanax and benzodiazepines amongst celebrities and music artists will be highlighted in section 2.4.2, in a bid to describe this rising phenomenon.

2.4.1 User demographics

In Kapil et al.'s 2014 UK-based online questionnaire inclusive of 1500 participants, the age of the sample population was predominantly 21 – 39 years (40.5%) and 50 – 59 years (29.3%) and only 9.1% of the sample were aged 16 – 20. However, only 392 of the 1500 participants reported having tried at least one benzodiazepine or Z-drug, and only 116 had self-reported misusing[4] them. A breakdown of the demographic information was unobtainable and therefore it is unknown whether these 391 participants were in the same age bracket of those portrayed across the media, and thus this data cannot be directly compared.

Earlier this year, popular lifestyle and culture magazine *VICE* launched a nationwide survey using social media platform *Snapchat*, which asked questions regarding individuals' knowledge of Xanax and their levels of use. Of the 85,000 respondents gathered which are assumed to be predominantly aged 13 – 24, 35% admitted to knowing at least one friend who takes Xanax (VICE, 2018b). This is the largest survey examining the prevalence of Xanax today, however, as noted in previous chapters, the level of legitimacy of news articles is almost always questionable and misleading (Sumner et al., 2014) especially around the deviant topic of substance abuse (UK Drug Policy Commission (UKDPC), 2012).

With the scaremongering media strongly focusing on the negative side effects and in the absence of up to date academic research on use in the UK, we are left with little credible evidence and limited understanding of this apparent rising drug use trend.

[4] The term 'misuse' was undefined, however it is assumed that it meant they were taken without correct clinical guidance.

2.4.2 Cultural accommodation

The verbal exclamation of the efficacy of benzodiazepines is not a new phenomenon. As well as the Rolling Stones in 1966 highlighting the need for benzodiazepines as explored in section 2.3, in the late 1990s, famous rapper Ice-T exclaimed:

> *Need some Xanax, want some pills, 'cause I don't like the way I feel*

(Body Count, 1997)

Sad hip-hop and rap has become a popular music genre amongst young people in America and the UK in the last couple of years and may have influenced the normalisation of Xanax and other benzodiazepines in self-medicating terms. The discussion of the misuse of prescription drugs online and throughout music can act as negative behaviour reinforcement and create new social norms (Blake, 2007; Hanson et al., 2013). Using an online site with a colossal music database[5], benzodiazepine terms and references were searched for and are displayed in the table below (all searches were made on the 15th November 2018):

Term	**Number of matches within lyrics**
'Xanax'	133
'Xans'	234
'Valium'	310

Table 4: Benzodiazepine terms within song lyrics

The table above shows that the term 'Valium' had featured 310 times, 76 more times that the shorted Xanax term: 'Xans'. It must be noted that the figures above may include unrelated mentions and/or fail to include every single relatable song lyric[6].

[5] www.lyrics.com : 'The Web's Largest Resource or Music, Songs & Lyrics'
[6] The shortened terms 'vallies' and 'vals' were also searched for, but the results were not relatable to benzodiazepine drugs

2.5 Access, availability and cost

It has been suggested that ease of access to certain drugs almost definitely increases rates of usage (Friedman, 2006; Fleary et al., 2013), and facilitates individuals indulging in drug experimentation (see LeClair et al., 2015). The source of benzodiazepines can vary. Evidence from Kapil et al.'s 2014 UK study discovered that over half (n=64, 55.2%) of benzodiazepine using respondents had received the drugs via legitimate prescription, alongside two-fifths (n=46, 39.7%) obtaining them via friends and/or family members. A quarter (n=31, 26.7%) of individuals purchased them online; a fifth (n=23, 19.8%) from street dealers and 13 (11.2%) sourced them from outside the UK. However, the study did not differentiate the types of benzodiazepines and Z-drugs.

However, the expansion of clear- and dark-web markets since 2014 has been noted (see Monteith et al., 2016; Novak et al., 2016; Dittus et al., 2018) and current users are believed to obtain their benzodiazepines via other means, as opposed to via legitimate prescription as highlighted above. However, the source of benzodiazepines for current users remains relatively undiscovered. The vast development of technology and global interconnectivity undoubtedly facilitates easy access for users to obtain their drugs via other means: online-unregistered pharmaceutical companies; social media and; the dark-web. All points will be discussed respectively throughout the following sub-sections.

2.5.1 Clear-web and social media

Launched in the late 1990's, the first online pharmaceutical sites had the intent to enable convenient access to prescription medication (United States General Accounting Office, 2000). However, unregistered, unlicensed pharmaceutical webpages began to mimic legitimate sites and have since penetrated the clear-web scene, and are frequently used when obtaining hypnotic and sedative drugs (Novak et al., 2016). Even though the MHRA has attempted to combat users buying from illegitimate sources by launching website with a list of all authorised online sellers of medicines (see MHRA, 2018b), several research papers have identified numerous illicit pharmaceutical sites for a variety of prescription drugs over the years (Wax, 2002; Bachhuber and Cunningham, 2013; Monteith et al., 2016), however there is limited published research examining the clear-web sales of benzodiazepine drugs.

A simple Google search of 'Xanax tablets UK' revealed a website selling numerous benzodiazepines such as Xanax for as little as £1.20 per pill. It stated:

> *You can buy Xanax pills online at cheap price from our trustworthy platform sleeptab.com*

After a quick search on the MHRA register of authorised pharmacies (see MHRA, 2018b), it was soon discovered that www.sleeptab.com was an illegitimate website. See appendices 5 – 7 for screenshots.

Although social media sites explicitly state that there should be no promotion of the use and sales of non-medical drugs (Facebook, 2018: see 'community standards'), the ability to connect instantly and more frequently has been manipulated by illicit drug buyers and sellers and according to the think tank McAfee Institute[7]: 'Finding drugs on Facebook is easier than buying a cup of coffee' (McAffee Institute, 2018). Accommodating to cultural norms, former street dealers use apps to build online profiles where they may imply or state that they are selling substances using a range of key words (Katsuki et al., 2015). It is thought that buyer-seller conversations are then moved to encrypted messaging apps such as *Wickr* (Guardian, 2017; BBC News, 2018e). Similarly, drug-related forums such as *Reddit* and *Bluelight* are also useful in gaining information and advice about sourcing benzodiazepines, and members often encourage others to head to dark-web markets for discrete door to door delivery and cheap prices. See appendices 8 – 10 for screenshots of *Twitter*, *Instagram* and *Reddit* posts respectively[8].

However, WHO (2009) estimate that half of pharmaceuticals sold on unlicensed webpages are counterfeits (cited in Lavorgna, 2015) and thus, there is a desperate need for correct content analysis in order to minimise risk. Alarmingly, figures suggest that 1 in 4 higher education students, inclusive of those studying health care topics, are unaware of danger signs advertised by illegitimate internet pharmacies and are likely to be misled by professional-looking webpages, which closely imitate reputable sites (Ivanitskaya et al., 2010). Thus, researchers are urged to scope out the online sales of benzodiazepine drugs via unregistered pharmaceutical sites in order to limit sales.

[7] 'We offer professionals all around the world the ability to learn the topics they are most passionate about all online from their home, office, or anywhere else they want to learn.' - https://www.mcafeeinstitute.com/
[8] All searches were made on 26/10/2018

2.5.2 Dark-web

In February 2011, the world became more vulnerable to technological deviancy with the emergence of the first successful cryptomarket – *Silk Road* (Soska and Christin 2015). Often referred to as the '*EBay for drugs*' (Barratt and Aldridge, 2016; EMCDDA, 2016a; Dittus et al., 2018), members could acquire digital goods or fireworks, but predominantly it was used to purchase drugs (Christin, 2012), by using a digital and non-identity-carrying payment method (Barratt and Aldridge, 2016). Silk Road has since been shut down, however law enforcement efforts of taking out vendors and closing whole cryptomarkets do not seem to prevent trading (Soska and Christin, 2015; Buskirk et al., 2017) and many more cryptomarkets swiftly emerged and continue to evolve. Evidence of the growth in this market highlight the limitations of previous, outdated research efforts (Kapil et al., 2014) and the need for more current research to scope out the source of benzodiazepines used in the UK.

According to the most recent Global Drugs Survey publication (2018), respondents who purchase benzodiazepines on the dark-net has increased since 2015. See below for a visual representation.

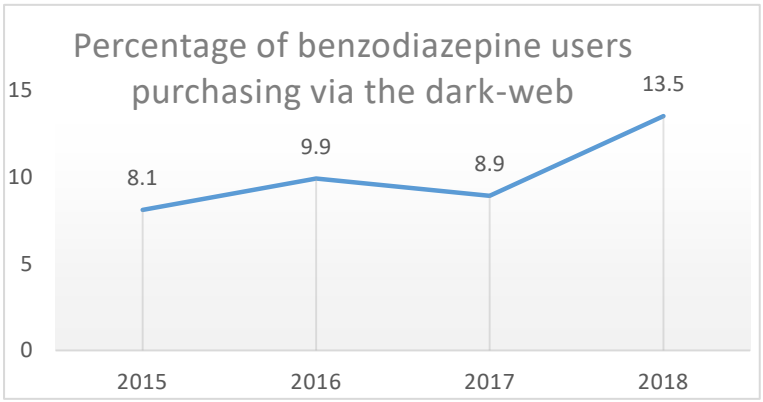


Figure 1: Percentage of benzodiazepine users purchasing via the dark-web

Moreover, data from 2017 analysed by researchers at the Oxford Internet Institute discovered that 22% of Xanax trades from the dark-web are accounted for by the UK. Out of the 1.5 million trades that were monitored, the group of researchers found that 50,000 of those were Xanax-related (cited in The Guardian, 2018a). Online dark-web markets namely *Alpha Bay* and *Hansa* were analysed, and transaction reports discovered that from 2015 to 2017 inclusive of 21 months, over 1.5 million fake Xanax bars were sold to Great Britain alone (BBC News, 2018c). It is thought that Xanax bars can be bought on dark-web markets for as little as 30p each (VICE, 2018a). However, this data is relatively broad and does not necessarily account for current, young users. Therefore, this research project attempts to add more robust, academic evidence as to where UK users are currently sourcing their benzodiazepines.

2.6 User motivations

Based on the theory that motivations must be unpicked *first* in order to explain illicit drug use behaviours (see DiClemente, 1999), this section provides an overview of national and international studies exploring possible motivations for the non-prescribed use of benzodiazepines. After discussing the perception of risk and social acceptance in section 2.6.1, this section will be divided into separate user motivations based on Boyd et al.'s study (2006): those who use them to self-medicate (section 2.6.2 for sleep issues and section 2.6.3 for anxiety issues) and those who use benzodiazepines for other, recreational purposes such as: to relax (section 2.6.4.1); to get high (section 2.6.4.2) and/or; to 'come down' from stimulant substances (section 2.6.4.3).

2.6.1 Perceived risk and social acceptance

A key motivator for purchasing and consuming benzodiazepines can be due to their low levels of perceived risk and deviance. Prescription drugs are thought to be a lot safer than street drugs (Friedman, 2006; Fleary et al., 2013; Kapil et al., 2014) and are therefore far more socially accepted (Bettinardi-Angres et al., 2012). Users often do not view their misuse and/or overuse of prescription drugs as problematic, as they are often able to sustain a conventional persona (Bardhi et al., 2007; Chandler et al., 2014) and it has been suggested that individuals who believe prescription drugs pose little harm are approximately 10 times more likely to partake in non-medical use (Arria et al., 2008).

Consumer culture justifies the consumption of a small pill for fast pain relief (NIDA, 2011), and users trust that they are approved by health care advisors, regardless of their strong potency (Grahn, 1983). However, it must be noted that non-prescribed, illicitly bought 'pharmaceuticals' are not always legitimate. In a UK context, Xanax is a special cause for concern as it is not available under NHS prescription, and is therefore likely to be custom pressed and illegitimate. The interdisciplinary nature of this research project includes chemical analyses of assumed 'Xanax' and 'Valium' street samples from Manchester, methods and results of which will be outlined in Chapter Five and Six respectively of this thesis.

2.6.2 Sleep issues/insomnia

As stated in section 2.2, the family of drugs possess powerful sedative properties and their efficacy has been noted. Although not all users visit the GP to obtain their benzodiazepines, international studies have shown that non-prescribed users commonly use benzodiazepines for their intended use: to get to sleep (see Boyd et al., 2006; Paredes et al., 2008; Andersson and Kjellgren, 2017), which runs parallel to UK users: two-thirds (n=77, 66.4%) of benzodiazepine users in Kapil et al.'s

study stated they did so to get to sleep. However, UK media coverage has solely focused on self-medicating teens. For non-prescribed users who take benzodiazepines for their intended use, there is a vast lack of knowledge and thus, this research project wishes to bridge that gap.

2.6.3 Self-medicating in the age of anxiety

A consistent theme which has emerged throughout the recent media reports is that individuals are using Xanax, Valium and other benzodiazepines to self-medicate for any underlying mental health issues (see BBC News, 2015; ITV News 2018a; Metro, 2018; Mirror, 2018; The Guardian, 2018b; The Guardian, 2018d; The Telegraph, 2018; VICE, 2018a). In a short film by *VICE*, an 18-year-old female from London spoke about her Xanax use:

> *"I was taking about 3-4 bars… They just numbed the horrible feelings of life and they just made you feel like it was just you and yourself rather than you and all your thoughts"*

(VICE, 2018c: 2min28secs)

Although media reporting is often exaggerated and unreliable, many international academic research papers support this motive and have discovered that non-prescribed benzodiazepine users commonly do so to self-medicate for symptoms of anxiety, panic attacks, nervousness, social unease or big life stresses (see Pederson and Lavik, 1991; Rigg and Ibañez, 2010; Andersson and Kjellgren, 2017). 43 respondents in the UK study also admitted to taking anxiolytics when they were stressed (Kapil et al., 2014). However, there is a huge lack of recent, UK-based academic evidence to back the copious amounts of media publications.

Anxiety is the feeling of fear and excessive worry regarding everyday tasks and events (Gale and Oakley-Browne, 2004), whereby sufferers may experience an accelerated heart rate, hyperventilation, shortness of breath, cold sweats and disorientation (Dunn, 2016; Bandelow et al., 2017). It is thought that anxiety levels peak during adolescence and early adulthood (Whiteford et al., 2013, cited in Vannucci et al., 2016; Hagell et al., 2015): three quarters of lifelong mental health issues arise before the age of 24 (Kessler et al., 2005). Data from Universities UK discovered a dramatic 5-fold increase of the number of undergraduate (UG) students disclosing a mental health condition in the last ten years (Universities UK, 2018): from 8,415 in 2007 – 08 to a colossal 49,265 in 2017 – 18. The visual data presented in appendix 11 demonstrates the steep rise in reported mental health amongst UK students in the past decade. With teenage suicide rates having increased 67%

since 2010 (ONS 2018, cited in The Independent, 2018), it is vital to maintain the well-being of young people and make sure there is adequate help and support for those suffering. This is a national health issue.

Investigated by the National Union of Students (NUS) with the assistance of the drug charity Release, drug trends and user motivations were examined amongst 2,810 students. A third of respondents who take drugs did so to cope with stress (31%); just over a fifth claimed to use drugs to self-medicate and alleviate any existing mental health issues (22%) and; 11% of respondents said they take drugs to cope with a difficult life event (NUS and Release, 2018). Although these figures do not specify the non-prescribed use of benzodiazepines, this data may be a useful indication of the rise of self-medicating young people. Self-medicating may be considered as the most private and sometimes the easiest way for short-term relief when other methods are unreliable.

With soaring house prices and crippling university debt, it is widely acknowledged that young people of today have overwhelming concerns regarding their academic life and finances (Mind, 2008; Meltzer et al., 2013; Parmar et al., 2016; OECD, 2017; Young Women's Trust, 2017; Gunnell et al., 2018). Studies reveal that school pressure and money woes are the dominant causes of anxiety amongst young people (Varkey Foundation, 2017), and some teens even reported to self-medicate with Xanax when exam stress hits (see The Telegraph, 2018). Evidence suggests there is a strong association between financial strain and ill mental health (see Mind, 2008; Meltzer et al., 2013) and even suicide (see Parmar et al., 2016). The Institute of Fiscal Studies discovered that the average university graduate is left with a colossal debt of £50,800, and those from poorer backgrounds can be left with over £57,000 (cited in BBC News, 2017b).

The online world is an exciting prospect of opportunity (Ofcom, 2016), however, internet and social media use has been directly associated with a decrease in personal well-being (see Kraut et al., 1998) and excessive use has proven to spark symptoms of depression and anxiety (see Radabi et al., 2017), decreased self-esteem and feelings of inferiority (Homewood Health, 2017). Maintaining a well-liked persona online and offline can be strenuous (Seo et al., 2014; EdCan, 2017; Homewood Health, 2017; Mental Health Foundation, 2018), and it has been reported that nearly half of 18 – 24 year olds blame their high levels of stress due to comparing themselves to others online (Mental Health Foundation, 2018; EdCan, 2017).

In addition, the online world exposes people to the dangers and horrors across the globe (Collier, 2013; Livingstone and Smith, 2014), with scaremongering news articles highlighting concerns around famine, poverty, and terrorism (BBC News, 2018g; BBC News, 2018h; ITV News, 2018b respectively).

Seeing daily posts about incidents in neighbouring countries via the internet undoubtedly provokes feelings of discomfort, worry and fear and may evoke symptoms of anxiety and even PTSD (McHugh et al., 2018). Nearly one in five (19%) of internet users blame current affairs for their high levels of stress (Mental Health Foundation, 2018).

In light of this growing body of evidence surrounding young people and anxiety, this research project specifically sets out to explore whether current generation Z[9] users are using this group of drugs to self-medicate or whether their motivations for use are much broader.

2.6.3.1 Lack of mental health services and failure of treatment

UK citizens are fortunate in the fact that they have free access to mental health resources such as counselling and group therapy. However, figures show that only half of young people feel comfortable enough to discuss personal matters with their GP (Brooks et al., 2015), which may be a reason for anxiety issues often remaining undiagnosed (Kessler et al., 2002). Moreover, if they do approach help services, child and adolescent mental health service waiting lists are often long and some have been forced to wait up to 18 months (Care Quality Commission, 2017). Not only does mental health deteriorate whilst waiting for the appropriate support, the majority of those who wait are not directed to any other form of support or treatment in this time (Young Minds, 2018). This may be a key motive for anxious young people to source benzodiazepine drugs via other, illegitimate means and this research project wishes to explore this further. Moreover, it is not always certain that traditional treatment services are adequate. In the V*ICE* film, a rap artist exclaimed:

> *"I actually suffered from depression and anxiety... We [were] going to GPs, trying to get help but that made us worse… [They gave me] sertraline… Anti-depressants and anti-anxiety stuff. None of that shit worked. It made me feel like, dissociated. They don't prescribe Xanax"*

(VICE, 2018c: 7min20secs)

Nonetheless, NHS England have acknowledged that it is fundamental to improve treatment services and have highlighted investment strategies to improve access to mental health services by 2020 (see Department of Health, 2014). However, produced five years ago, the strategies in the NHS report seem to be ineffective as young people are treating their symptoms in other ways.

[9] Those born mid-1900s to early 2000s

2.6.4 Recreational use

It is said we currently live in a society where using prescription drugs to ameliorate or positively intensify life experiences is exceedingly common (LeClair et al., 2015). Benzodiazepines' euphoric effects are also enjoyed by international recreational users (Rigg and Ibañez, 2010; Vogel et al., 2013; Kapil et al., 2014; Weaver, 2015; Andersson and Kjellgren, 2017; Mateu-Gelabert et al., 2017) and a handful even experience psychedelic effects (Beharry and Gibbons, 2016). The following section will draw upon predominantly international studies, which highlight the recreational use of benzodiazepines to: unwind and relax (section 2.6.4.1); actively get high (section 2.6.4.2) and; counteract the effects of stimulant drugs (section 2.6.4.3). Although the majority of the studies displayed in the following section are international, findings may provide an insight into user habits in the UK.

2.6.4.1 Relaxation

Using sedative drugs for anything other than their clinical uses is very much like alcohol intoxication (Weaver, 2015), and the recreational use of CNS prescription drugs has been noted to *'intensify relaxation'* and *'maximise down time'* (LeClair et al., 2015). Benzodiazepine drugs are commonly praised for their euphoric and relaxing effects, however, there is a deficit of up to date, academic evidence and it is not known whether current UK users use them for this reason.

2.6.4.2 To get high

Some recreational users claimed to use benzodiazepines in order to accentuate the high of the intoxication of other drugs, as explained by multiple participants in Rigg and Ibañez's study (2010): *'[to] take it to another level'*. It is also believed that alcohol drinkers consume benzodiazepines to augment the feeling of being drunk (Lader, 2011), and opioid users to increase the high (Vogel et al., 2013). The majority of benzodiazepine users in an American study did so to '*get high'* or *'messed up'* (see Rigg and Ibañez, 2010).

It was also noted that recreational users tend to ingest prescription drugs differently, in order to alter the high (Rigg and Ibañez, 2010; Andersson and Kjellgren, 2017). Non-oral methods include snorting, smoking and/or injecting. Benzodiazepine routes of administration amongst non-prescribed users in the UK remains totally undiscovered, thus the sociological research element of this project wishes to explore common methods of administration and how they relate to user motivations.

2.6.4.3 To 'come down' from stimulants

Benzodiazepines were also noted to be useful when wanting to eradicate the unwanted effects of other drugs (Schmitz, 2016) or to *'come down'* from stimulants (Rigg and Ibañez, 2010; Kapil et al., 2014; Beharry and Gibbons, 2016; Mateu-Gelabert et al., 2017) especially after excessive cocaine use (Bardhi et al., 2007; Motto-Ochoa et al., 2017).

2.6.5 Section overview

To summarise, motivations for the non-prescribed use of benzodiazepines vary greatly. The UK media has dominantly focused on self-medicating teens and despite only one academic report examining the non-medical use of benzodiazepines amongst UK users (see Kapil et al., 2014), international research studies and theories suggest CNS depressant drugs are frequently used to either heighten the feeling of intoxication (Andersson and Kjellgren, 2010; Rigg and Ibañez, 2010), and/or to counteract unwanted side effects of stimulant drugs (Bardhi et al., 2007; Rigg and Ibañez, 2010; Kapil et al., 2014; Beharry and Gibbons, 2016; Schmitz, 2016; Mateu-Gelabert et al., 2017).

However, the media dominated discourse raises questions of credibility, and the one reliable, UK academic paper is outdated and lacks in-depth analysis of user motivations. International studies begin to illustrate a picture of benzodiazepine use, however, these motivations may not be applicable to young UK users. Thus, this research project wishes to collect usage data from benzodiazepine users across the UK.

2.7 Adverse negative effects

The following section will begin by recapping the effect of benzodiazepines on certain areas of the body and brain as explored at the start of this chapter. It will then outline the following dominant adverse negative effects: temporary sedation, complex psychomotor tasks, accidents and injuries (section 2.7.1); memory impairment and cognitive decline (section 2.7.2); paradoxical stimulation (section 2.7.3); emotional blunting and depression (section 2.7.4); poly-drug use dangers (section 2.7.5) and lastly; tolerance, dependency and withdrawal effects (section 2.7.6).

As outlined in section 2.2.2, benzodiazepines can cause effect to:

1. The *brain stem* – This cares for vital bodily functions such as breathing, heartbeat and blood pressure.
2. The *spinal cord* and *cerebellum* – Physical body such as muscle relaxation, motor coordination, balance and posture.
3. The *cerebral cortex* – This affects the brain: consciousness, cognitive ability and concentration levels.
4. The *limbic system* – This cares for emotions and memory.

Despite a wide range of positive effects and functions as highlighted in section 2.2, the use of benzodiazepines, particularly for prolonged or sustained periods, can cause a range of potential harms and unintended side effects which have been noted for many decades (Hollister et al., 1961; Block and Berchou, 1984; Gardner and Cowdry, 1985; Thomas, 1988; Curran, 1986; Bond et al., 1991; Bond and Silveira, 1993; Curran et al., 1994; O'Sullivan et al., 1994; Kozená et al., 1995; Ashton, 2002; Paton, 2002; Verster et al., 2002; Barker et al., 2004; Friedman, 2006; Michael et al., 2007; Clegg and Young, 2010). The effects listed in the table below will be elaborated throughout the following section with published studies and experiments.

Short-term effects	Long-term effects
Temporary sedation and drowsiness	Impairment of memory processing functions
Lack of concentration ability	Emotional blunting
Accidents and injuries	Depression
Memory loss and black-outs	Rebound anxiety
Paradoxical rage and aggression	
Slow breathing and heartbeat	

Table 5: Short- and long-term effects of BZD use

2.7.1 Temporary sedation, complex psychomotor tasks, accidents and injuries

The short-term feeling of sedation, unsteadiness and slight disorientation may be a bearable side effect of benzodiazepines, however prolonged sedation and psychological impairment is a common side effect of hypnotic and tranquiliser drugs, which can last up to a week after administration (Bond et al., 1991). Levels of consciousness are fractured leaving the individual drowsy and dull, and they may lose the ability to maintain full concentration levels (Lader, 2011), thus, increasing the risk of accidents and injuries (Friedman, 2006). Prolonged use means it may persist and negatively influence everyday psychomotor tasks (Block and Berchou, 1984).

Whether prescribed or non-prescribed, benzodiazepine users must be aware that there is a direct link between usage and road traffic accidents (Ravera et al., 2011), corresponding with age and alcohol usage (Maxwell et al., 2010). Studies suggest that long half-life benzodiazepines (i.e. Valium) significantly distort individuals' driving ability during the first few weeks of usage (see Smink et al., 2010; Dassanayake et al., 2011) and risk of motor accidents among benzodiazepine users is approximately doubled (Thomas, 1988). Shorter-acting benzodiazepines have also caused alarming effects: a double-blind placebo study in Europe discovered that the administration of merely 0.5 mg of Alprazolam caused a significant deterioration in vigilance performance (Kozená et al., 1995). Supporting evidence comes from a double-blind crossover study collected by Verster, Volkerts and Verbaten (2002) who administered 1 mg of Alprazolam or a placebo to 20 healthy participants, who were then asked to complete a standardized 100 km Dutch driving test 1 hour after the drug was

taken orally. Alongside showing a diminish in alertness, decreased mental activation and a worsened quality of driving, 6 out of the 20 participants were unable to complete the driving test due to falling asleep at the wheel.

2.7.2 Memory impairment and cognitive decline

Many studies have proven that benzodiazepines significantly disturb vital attention and performance skills, alongside fracturing multiple processes such as visual perception and memory acquisition (see Block and Berchou, 1984; Barker et al., 2004; Michael et al., 2007) which increases with task difficulty (Curran, 1986). A French study examining the link between long-term benzodiazepine use and dementia discovered there was a 50% increased risk of developing the disorder (see Billioti de Gage et al., 2012), and prolonged use may permanently fracture memory and information storing (Curran, 1986; Curran et al., 1994).

Although short-term memory impairment and amnesia may be useful when used as pre-medication for surgical procedures (Kanto, 1986), it is sometimes an unpleasant side effect for casual users. Episodic memory impairments may lead to complete 'blackouts' (Ford and Law, 2014) and may result in erratic and uncharacteristic behaviour (Ashton, 2002). These effects are amplified with the addition of alcohol (Bond et al., 1991) and other CNS depressants (Griffin et al., 2013).

2.7.3 Paradoxical stimulation

Controversially, disinhibitory reactions such as increased levels of anxiety, hyperactivity, agitation and rage present themselves in some benzodiazepine cases (see Gardner and Cowdry, 1985; O'Sullivan et al., 1994) which increases significantly with the addition of alcohol (Bond and Silveira, 1993). It is believed that the powerful anxiolytic and amnesic effects waiver individuals' capability of adhering to appropriate social behavioural norms (Paton, 2002). Intoxicated users may show levels of hostility and erratic behaviour (Griffin et al., 2013) and even indulge in criminal activity due to the drug making them feel *'invincible'* (BBC Newsbeat, 2010; Ford and Law, 2014; Andersson and Kjellgren, 2017). As highlighted in the previous sub-section, it is often that users are totally unaware of any erratic behaviours whilst they are intoxicated, and have no recollection of the event (Lader, 2011). Shorter-acting, more potent benzodiazepines (i.e. Xanax) are more likely to induce these paradoxical effects (Ait-Daoud et al., 2018).

2.7.4 Emotional blunting and depression

Some researchers believe there is a link between benzodiazepine use and depression (Longo and Johnson, 2000) and some individuals may develop signs of delirium (Clegg and Young, 2010). On the other hand, Ashton (2002) claims that benzodiazepines may cause '*emotional anaesthesia*', whereby a user is numb to pleasure or pain. However, this area remains fairly under researched and the lack of evidence means it is difficult to draw conclusions. Thus, this research project wishes to explore the negative psychological effects as well as physical effects that users may experience as a result of benzodiazepine use.

2.7.5 Poly-drug use dangers

Studies have shown that poly-drug use is common amongst those who misuse prescription drugs (see Busto et al., 1986; Rigg and Ibañez, 2010; Kurtz et al., 2011; Kelly et al., 2013; Andersson and Kjellgren, 2017; Mateu-Gelabert et al., 2017) and that benzodiazepines are not usually the first substance added to the poly-drug cocktail (Schmitz, 2016; Mateu-Gelabert et al., 2017). In addition, those misusing benzodiazepines alongside other substances are more likely to consume significantly higher dosages than those misusing benzodiazepines alone (Busto et al., 1986) which unquestionably increases the risk of overdose and fatalities.

Altering vital bodily functions like the heart rate and breathing comes with added risk, and individuals who exceed the recommended dosages or take them in conjunction with other CNS depressants could be left in a coma or even face death (NIDA, 2011). Of the 3,756 registered poly-drug poisoning deaths in England and Wales in 2017, 319 involved benzodiazepines (ONS, 2018). Benzodiazepine-only deaths have increased by 30% within the last year (from 17 to 22), and benzodiazepine poly-drug deaths involving selected substances have increased by 90% in the last decade (from 207 in 2007 to 391 in 2017). Deaths involving Diazepam have also risen significantly. Since data collection began back in 1993, the number of Diazepam-related deaths have seen a 5-fold increase (from 52 in 1993 to 226 in 2017) (ibid.). See appendix 12 for a visual representation of benzodiazepine-related fatalities in England and Wales.

Issues also arise when users consume 'uppers' such as MDMA or cocaine, alongside 'downers' such as benzodiazepines in a short time frame. The individual effects of each drug on bodily functions are so juxtaposing that the body may become overwhelmed and suffer dramatic levels of stress. However, the exact chemical reactions in the body remain under researched and it is not known whether these effects are experienced by poly-drug users.

2.7.6 Tolerance, dependency and withdrawal

Forming an addiction to prescribed pharmaceuticals is certainly not a new phenomenon: it has been known for many decades that misusing and/or overusing benzodiazepines can cause psychological dependency (Hollister et al., 1961; Covi et al., 1973; de las Cuevas et al., 2003). Thus, in 1988, the Committee on Safety of Medicines (CSM) strongly advised that benzodiazepine usage should not exceed 4 weeks (see Committee on the Safety of Medicines, 1988). The media have reported several cases of involuntary dependence over the years (BBC News, 2001; The Guardian, 2002; The Guardian, 2003; Hampshire, 2004), and Ray Nimmo was the first to legally sue his GPs in 2002 for involuntary addiction (The Independent, 2011).

It must also be noted that because the speed of onset is also linked to routes of administration (Rigg and Ibañez, 2010; Andersson and Kjellgren, 2017), those who choose to snort their drugs feel reinforcing effects much faster and thus there is a higher potential of problematic use and addictive behaviour (Compton and Volkow, 2006). However, UK research has failed to capture user's routes of administration and therefore it is unknown how current benzodiazepine users consume them.

Those who disregard the recommendations are undoubtedly increasing their levels of tolerance, and are more liable to experience adverse negative effects explored in previous sections. Tolerance to benzodiazepine drugs becomes apparent just after a few weeks of continuous daily consumption (Hollister et al., 1961; de las Cuevas et al., 2003), which can result to an increased dosage and potentially increase the frequency of use. It is common that some individuals may still experience waves of negative symptoms like anxiety and unease whilst still taking benzodiazepines as they become tolerant to a certain volumes of dosage. This may lead to an increase in dose or the addition of another benzodiazepine (Ashton, 2002).

Adverse negative effects, dangers and recommendations have been seemingly ignored and showed to have little effect on the length of prescriptions issued in the UK. Although there is a scarcity of legitimate statistics, researchers have previously estimated that around 500,000 to 1.5 million people are dependent on prescribed benzodiazepines in the UK alone (Heather et al., 2004; Ford and Law, 2014). However, this data does not account for those using benzodiazepines without prescription. Recent data from Public Health England revealed that figures for children and young people (under 18 years old) accessing benzodiazepine treatment has almost doubled in the last year: from 161 from 2016 – 2017, to 315 from 2017 – 2018 and those needing support for Xanax usage problems has increased 6-fold within the last year (see Public Health England, 2018). With the

majority of those aged 17 – 18, this data confirms that young people are sourcing these drugs for whatever reason and forming problematic habits.

Benzodiazepine withdrawal is often characterized by aggressive rebound symptoms which are contradictory to the initial therapeutic effects, and long-term users may suffer with symptoms like rebound anxiety, depression, psychotic tendencies, agitation, loss of appetite, distorted perceptions of reality, abnormal body sensations and even seizures (see Hollister et al., 1961; Péterssun, 1994). After halting insomnia medication, the sleeping disorder can return with vengeance and may be more exaggerated: the time it takes to get to sleep is prolonged, sleep is often distorted and much shorter (Lader, 1991; 2012).

Withdrawal symptoms may also form as new, unfamiliar emotions. Displayed in the table below, Ashton (2002) describes a handful of psychological and physical symptoms that users experienced whilst attending her benzodiazepine withdrawal clinic (n=50). Supervised tapering methods are advised when coming off CNS depressant drugs (NIDA, 2011).

Psychological symptoms	**Physical symptoms**
Insomnia, bad dreams & other sleep disruptions	Pain and stiff limbs
Anxiety and panic attacks	Weakness and fatigue
Depression	Muscle spasms
Distortion of perception and reality	Palpitations, increase in perspiration
Aggressive behaviour and irritability	Gastrointestinal issues
Memory failure and poor concentration levels	Numbness and altered sensations

Table 6: Common benzodiazepine withdrawal symptoms

2.7.7 Section overview

The adverse negative effects of benzodiazepine use have been noted for many decades, however studies and research papers displayed in the section above focused solely on pharmaceutical grade benzodiazepines and their side effects. What we do not know however, is the impact of non-pharmaceutical grade substances and their proposed dangers. As the media suggests, current UK users are using benzodiazepines off-prescription which may incur many more unknown risks and hazards. Thus, this research project wishes to collect data regarding the effects (desired and undesired) experienced by non-prescribed users.

In addition, non-prescribed benzodiazepine users are often unaware of the adverse negative effects of use and misuse (Ashton, 2011) and those who are illicitly sourcing substances may be exposed to counterfeit tablets, laced with other, sometimes harmful adulterants. Risks of fatalities are much higher, especially when taken in conjunction of other substances. The risk of counterfeit drugs will be explored in Chapter Five: section 5.1.3.

2.8 Summary of chapter and conclusion

To conclude, this chapter reviewed the existing literature regarding the use and misuse of benzodiazepines in the UK. It uncovered plentiful media coverage predominantly reporting on self-medicating teens (see BBC News, 2015; ITV News 2018a; Metro, 2018; Mirror, 2018; The Guardian, 2018b; The Guardian, 2018d; The Telegraph, 2018; VICE, 2018a, VICE, 2018c) and just one academic research paper (see Kapil et al., 2014). However, media publications are often unreliable and despite only being five years old, the reported steep rise of the use of Xanax is unlikely to have been captured in the study from 2014. Furthermore, the sample size is relatively small for a quantitative study (392 total benzodiazepine users, 116 reported to have 'misused' them) and thus cannot represent the wider population.

A handful of international papers and just one UK-based study have suggested that non-prescribed benzodiazepine user motivations are: to help sleep and to alleviate symptoms of anxiety or stress (see Pederson and Lavik, 1991; Boyd et al., 2006; Paredes et al., 2008; Rigg and Ibañez, 2010; Kapil et al. 2014; Andersson and Kjellgren, 2017); to actively get high and/or to heighten other drug effects (see Andersson and Kjellgren, 2010; Rigg and Ibañez, 2010), or; to counteract the effects of stimulant drugs (Bardhi et al., 2007; Rigg and Ibañez, 2010; Kapil et al., 2014; Beharry and Gibbons, 2016; Schmitz, 2016; Mateu-Gelabert et al., 2017). Nonetheless, these are merely *potential* motivations for UK users. Without reliable, academic research exploring benzodiazepine user demographics, motivations, usage trends and the true contents of the illicitly sourced 'medications', it is impossible

to provide a confident overview of the phenomenon and advise users, policy makers and health care professionals in an attempt to reduce risks and fatalities.

Recent statistics revealed that 22% of Xanax trades are accounted for by the UK (The Guardian, 2018), highlighting the evolvement of technology and online clear- and dark-web markets as a direct reflection of the increase in usage. The ease of access to drugs is a key motive for some, and some have suggested Xanax is easier to obtain than alcohol which may account for the spike in young users. Thus, this review of existing literature has highlighted the need for further UK-based research into the use of benzodiazepines and in particular, Xanax and Valium.

The end of the current chapter stated the short- and long-term adverse negative effects of benzodiazepine use which have been acknowledged for many decades (see: Hollister et al., 1961; Block and Berchou, 1984; Curran, 1986; Asthon, 2002; Paton, 2002; Verster et al., 2002). What we do not know however, is how the these drugs are used without prescription, and the side-effects from non-pharmaceutical grade benzodiazepines.

The following chapter will outline the research methodology used for the social science element of this project.

Chapter Three: Sociological Methodology

3.1 Introduction and chapter overview

As highlighted in the previous chapter, there is a deficit of up to date, academic, reliable research examining the use and misuse of non-prescribed benzodiazepines in the UK. Thus, this mixed methods research project comprises of a web-based survey alongside face-to-face interviews which were used to efficiently collect quantitative and qualitative data from benzodiazepine users in the UK, with the intent to explore:

- Which benzodiazepines are popular?
- Who is taking benzodiazepines?
- What are the motivations for use?
- What are the effects (both desired and undesired) of benzodiazepine usage?
- Where do users source their non-prescribed benzodiazepines?
- What factors influence benzodiazepine users' decisions on what benzodiazepines they use and where they obtain them?

The previous chapter highlighted the development of technology and social media and the negative impact this may have on web users' mental health (see section 2.6.3). However, it was also made clear that the online world has been embraced by the wider population (De Vaus, 2014), and geographical boundaries are waved due to the interconnectivity that social media enables (Ngai et al., 2015). By positively adapting to the cultural norm of social media and the online world, a web-based survey was created using *Qualtrics*[10], which was distributed on a handful of online networking pages mainly *Facebook*, *Twitter* and drug-related forums such as *Reddit and Bluelight.* Specifically, 41 *Facebook* groups across the UK were joined. The 23-question survey (see appendix 13) consisted primarily of close-ended questions, however four open-ended questions were woven throughout enabling rich, textual data to be collected (Burnett, 2009). Almost all questions also allowed for 'other' or 'additional comments', which enabled respondents to enclose personal experiences and opinions should they wish to.

A handful of face-to-face interviews were also conducted for the elaboration and growth of key points (Rossman and Wilson, 1985). The desired number of interview participants was originally set at 10 – 15, however due to the higher than anticipated number of survey respondents, including a

[10] Qualtrics: 'It's sophisticated, yet simple, giving you the power to create and distribute surveys for any audience via any channel': https://www.qualtrics.com/uk/

significant amount of free text comments (discussed further in section 3.5.2), this volume of interviews was deemed unnecessary. Subsequently, data was collected from a smaller number of five interviewees. The survey ran from the 1st March 2018 – 8th June 2018 and a total of 771 responses were gathered prior to cleaning. Survey data was inclusive of 595 cleaned quantitative and qualitative responses. Interviews were carried out over the same period.

The following chapter provides an overview of the methodology used for the social science research element. It will begin by outlining the rationale for adopting a mixed methods approach and a brief overview of the online survey and interviews in section 3.2. Section 3.3 will outline the research strategy for the online survey in-depth, specifically: a discussion of ethics (section 3.3.2); sampling recruitment methods (section 3.3.3) and; how and why the survey was distributed via social media and other means in order to target specific audiences (section 3.3.4). Section 3.4 will mimic the layout of the quantitative methodology yet will describe the research strategy for the qualitative element: the face-to-face interviews. The section will include: an ethical discussion (section 3.4.2) and; sampling and recruitment tactics (section 3.4.3). Data cleaning and analysis was a long and complex process and which will be outlined in section 3.5. Section 3.6 will reflect and highlight the issues of the social research method used.

3.2 Mixed methods approach and rationale

Ivankova et al. (2006) assert that using purely quantitative or qualitative research methods alone will not yield fully adequate results. New, intricate societal phenomena have created diverse and often complex issues for research personnel (Tashakkori and Teddlie, 2003; Creswell and Plano Clark, 2011) and in order to determine complete and sufficient answers, sophisticated methodology and analysis inclusive of a variety of research methods is a popular approach used by many sociological researchers in recent decades (Lopez-Fernandez and Molina-Azorin, 2014). Considered as the 'third methodological movement' (Tashakkori and Teddlie, 2003; 2010), mixed methodology consists of the combination of quantitative and qualitative research tools in a single study exploring the same phenomenon (Denzin, 1978).

Employing a mixed methods research design undoubtedly requires more effort and time (Adowitz and Toole, 2010) and some believe that that qualitative and quantitative tools belong in different paradigms (Tariq and Woodman, 2013). However, others believe that applying quantitative research tools enables the assessment of the extent and frequency of a certain social phenomenon, and extensive qualitative research methods are able to acquire deeper understanding and corroboration (Tashakkori and Teddlie, 2003; Johnson et al., 2007). Quantitative research methods seek to quantify

variation whereas qualitative methods of data collection and analyses use descriptive information to describe the variation (Bernard, 2011).

In their 1989 paper, Greene et al. identified five key purposes and rationale for employing mixed methodology. *Triangulation* is defined by boosting levels of validity by presenting parallel findings through different research means; *complementarity* increases the interpretability and clarification of results; *development* is defined by adopting the results from one method in order to assist in the development of another; *initiation* is characterised by exposing paradoxical results through expanding the breadth and depth of the outcomes; and *expansion* seeks to use a variety of methods for distinct elements of inquiry. These have been displayed in various research studies in different disciplines over the years, see Campbell and Fiske (1959); Sieber (1973); Madey (1982); Rossman and Wilson (1985); and Creswell (2014).

The utilisation of a mixed methods approach in the current study, as Blaikie (2009) stated, eliminated the possible limitations of each approach. The display of rich, textual qualitative data counteracted the ideology that quantitative data lacks elaborative detail (Rossman and Wilson, 1985; Bryman, 2015) and as Sieber (1973) states:

> *'The integration of research techniques within a single project opens up enormous opportunities for mutual advantages in each of three major phases – design, data collection and analysis'*

Using mixed methods has the potential to uncover unprecedented variance which may have been missed by single methods (Jick 1979), and is therefore an exceptionally useful tool when answering new, undetermined questions and filling gaps in research. Most importantly, multiple authors believe that *triangulation* magnifies the accuracy of conclusions (Denzin, 1978; Jick, 1979; Greene et al., 1989) and that utilizing multiple methods increases levels of validity (Rossman and Wilson, 1985), as it makes room for confirmatory questions (Hall, 2008).

Where mixed methodologies that incorporate both qualitative and quantitative data collection techniques are increasingly advocated, this research project is unique in incorporating an interdisciplinary element: hard analytical science. Complex laboratory tasks using presumptive testing methods and GC-MS were used in order to determine the quantity and quality of seized street samples (assumed to be Xanax and Valium) from Greater Manchester Police (GMP). Methodology and results of the chemical analyses will be outlined and discussed in Chapters Five and Six.

3.3 Quantitative methods – online survey

As outlined above, the quantitative element of this research took form as a web-based survey constructed via the online software *Qualtrics* and had the intent to examine:

- Which benzodiazepines are popular?
- Who is taking benzodiazepines?
- What are the motivations for use?
- What are the effects (both desired and undesired) of benzodiazepine usage?
- Where do users source their non-prescribed benzodiazepines?
- What factors influence benzodiazepine users' decisions on what benzodiazepines they use and where they obtain them?

The following section will begin by outlining the survey research strategy and development (3.3.1) before discussing ethical issues, specifically: information sheet and consent (section 3.3.2.1); participant confidentiality (section 3.3.2.2) and; protection from harm (section 3.3.2.3). Section 3.3.3 will discuss the sampling and recruitment tactics employed, in particular: how participants were addressed and targeted. Section 3.3.4 will outline distribution methods in-depth and state where and when the survey link was posted including screenshots of posts. Specifically: *Facebook* (section 3.3.4.1); *Twitter* (section 3.3.4.2); *The TAB* Newspaper (section 3.3.4.3) and; physical QR code leaflets (section 3.3.4.4).

3.3.1 Survey research strategy and development

Surveys are the most popular method for collecting quantitative data (Burnett, 2009), and as a self-funded post-graduate student, keeping research costs to a minimum was an important consideration. Surveys are usually low in cost (Buchanan and Hvizdak, 2009) and it is an efficient way of collecting data from a vast number of respondents (Suri and Patel, 2012). Therefore, the main element of research took form as an online survey which was widely distributed online and offline.

It is highly important that research is reliable, valid, representable and generalisable (Sapsford, 2007; Burnett, 2009). Scholars have previously highlighted the importance of obtaining *enough* data (Burnett, 2009) and justifying rates of response (Baruch, 1999). However, as non-prescribed benzodiazepine use is an emerging trend in the UK, it was deemed necessary to obtain as many responses as possible.

It is important that pilot studies are run in order to gain feedback about the difficulty of task and engagement from participants (see Converse and Presser, 1986:54). Convenience sampling was used to recruit two participants before the survey link was officially distributed. A highlighted concern was that the length of survey would reflect negatively on rates of completion (Burchell and Marsh, 1992). With this to consider, questions were simplified and all questions except consent were optional. According to online information provided by *Qualtrics*, generally, up to 53% of respondents begin surveys via their mobile phone. Adjusting to this notion, the survey was mobile phone and tablet friendly in order to increase response and completion rates. Unfortunately, data examining how the respondent completed the survey could not be captured retroactively.

It was noted that certain groups and populations are more inclined to be more active on social media than others (Ngai et al., 2015), and considerable differences may occur between platforms (Social Media Research Group (SMRG), 2016). Thus, *Facebook* was used to target a younger population, primarily students; *Twitter* was used to target academics; and *Reddit* and *Bluelight* were chosen as they are well known for publishing substance usage trends and may have appealed to other drug users. Specific *Facebook* groups were joined in order to access specific populations, which will be explored further in section 3.3.4.1. The researcher also distributed emails and private messages to those relevant. In addition, 250 single-sided leaflets containing the QR code of the survey (see section 3.3.4.4: image 8) were also distributed in Greater Manchester amongst restaurants, bars, clubs, popular coffee shops and bus stops in order to appeal to those who are inactive on social media. Physical distribution methods will be explored in-depth in section 3.3.4.4. Distribution methods will be explored extensively throughout section 3.3.4.

The online survey was inclusive of four open- and nineteen close-ended questions, and was divided into six sections as follows:

Section	Questions	Enquiry
1: Demographics	1, 2, 3, 4, 5,6	Age, gender, sexual orientation, ethnicity, geographical location and occupation
2: Which BZDs	7, 8, 9, 10	Which BZDs have been used ever and recently, BZD preference and why
3: Why, how, when, where	11, 12, 13, 14, 15, 16	Motivations for use, administration, dosage and usage context
4: Other substance use	17, 18	Other substance use/ in conjunction with BZDs
5: Supply	19, 20, 21, 22	Route of supply, prices
6: Substance replacement	23	Opinion regarding substance replacement

Table 7: Survey content

Relevant strengths were adopted from quantitative, statistical data collection methods. Close-ended questions allowed data to be collected more efficiently (Converse and Presser, 1986) and made it quick and easy for the participant with minimal effort required (Sue and Ritter, 2012) thus, increasing rates of completion (Burchell and Marsh, 1992). However, open-ended questions increase the likelihood of more valid responses (Sue and Ritter, 2012). Therefore, four optional, open-ended questions (see appendix 13: questions 10, 14, 16, 23) were sophisticatedly woven throughout the web-survey which enabled participants to enclose personal justifications for substance usage and give detailed accounts. These text answers enabled rich, emotional language which personified numerical data (Jick, 1979; Rossman and Wilson, 1985; Tashakkori and Teddlie, 2003). The majority of questions included 'other' or 'any additional comments' where respondents could leave text comments.

3.3.2 Ethical discussion

In order to legitimately validate research, ethical issues must be acknowledged and addressed (Suri and Patel, 2012). This study was potentially accessing a vulnerable population who were asked to enclose information about illicit substance use, purchasing drugs and ill mental health (Fox and Tracy, 1986; Nyamathi, 1998). Therefore, with adherence to 'The Ethical Guidelines' laid out by The Social Research Association in 2003, it was necessary to pursue objectivity when collecting and analysing data; refrain from undue intrusion; ensure full anonymity and confidentiality of participants and; minimise physical and psychological risk to field researchers and participants. See appendix 14 for granted ethical approval.

3.3.2.1 Information sheet and consent

It was crucial that participants were aware of the research aims and consequent purposes of the study to increase the quality of data (Buchanan and Hvizdak, 2009) and in order to give rationalised consent (Bryman, 2015). However, the difficulty of this increases when recruiting participants online as there is less of a chance for the participant to ask the researcher any questions, as there is no immediate physical interaction between the two (Moreno et al., 2013). However, participants were presented with a detailed information sheet (see appendix 15) before enclosing consent, where the researchers email was displayed encouraging individuals to email any questions regarding the study and their role. An issue with this, is that the participant may not choose to read the information properly (British Psychological Society, 2017). In order to encourage individuals to read the document, only crucial and relevant information was stated.

For research involving human participants, informed consent is a legal and ethical requirement (Nijhawan et al., 2013). Thus, individuals were prohibited from participating in the survey if they did not give confirmed consent. See below for a screenshot of the consent question displayed before the survey (on mobile).

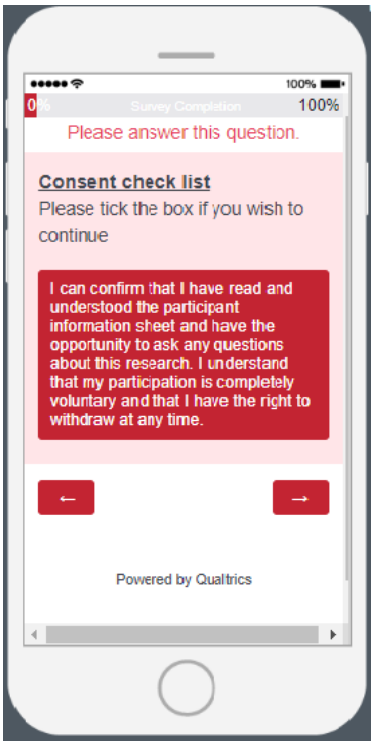


Image 1: Screenshot of compulsory consent question displayed on a mobile device

3.3.2.2 Confidentiality and traceable IP addresses

Despite using the advantages of the online world as will be discussed in the distribution methods in section 3.3.4, the use of online chat forums and social media sites to promote the survey brought additional ethical considerations, especially in relation to confidentiality. The online world is continuously growing and changing, leaving current laws and recommendations regarding data protection trailing behind (Suri and Patel, 2012) and maintaining privacy, anonymity and confidentiality is an overarching issue when using social media as means of participant recruitment and data collection (Hunter et al., 2018) due to traceable IP addresses (Suri and Patel, 2012). Although the privacy of a personal social media profile is controlled by the individual (SMRG, 2016), a click of a link or visit to another page is logged by that social media website and can potentially be traced back to that profile (British Psychological Society, 2017). Thus, participants in the current study were made aware that they could copy and paste the survey link in order to protect their identity. It must be noted that there is no static regulatory guidance regarding these ethical issues (Amon et al., 2014; Gelinas et al., 2017), and the full protection of participants' online identity was out of the researchers control (Buchanan and Hvizdak, 2009).

3.3.2.3 Protection from harm

Another dominant priority was to protect all participants from psychological harm. Due to the discussion of sensitive topics, it was thought that participants may feel signs of distress and guilt (British Society of Criminology, 2015). In order to eliminate these negative emotions, participants were made aware that their participation was voluntary and they had the right to withdraw at any point in a study (Social Research Association, 2003). However, online surveys may infringe this due to including mandatory responses (Suri and Patel, 2012). Thus, bar consent, no questions were compulsory and all participants are made aware that they have the right to withdraw at any time. Conducting research online may also mean participants fail to partake in the debriefing process (British Psychological Society, 2017). Instead, participants in the current study were urged to contact the researcher via email should they have any concerns or general questions.

Psychological and physical risks toward the researcher must also be considered and kept at a minimum (Social Research Association, 2003). Stern (2003:249) highlights researchers' exposure to 'encountering distressing disclosure' when researching sensitive topics online. Individuals are more likely to express distressing information about harming themselves or others due to having 'private authorship' (see Stern, 2003:251). Conversely, possible physical risks of being a lone female were eliminated due to avoiding face-to-face interaction.

The fine line between employing proper research conduct and ensuring ethical obligations to participants often causes tensions for online researchers (Suri and Patel, 2012). A route of bypassing arguably unethical research is to prioritise the importance of the findings (Ahmadulla, 2012), and ensure that the wider society will benefit (Social Research Association, 2003). For the current study, exploring an under researched, rising phenomenon, examining citizens' benzodiazepine drug use habits has the ability to inform policy makers and health care professionals (LeClair et al., 2015; Järvinen -Tassopoulos, 2017), which has the capacity to directly protect users and the wider society from harm and thus, the research design was justified.

3.3.3 Sampling and recruitment

The growth of the internet and accessing hard-to-reach populations has prompted the use of purposive sampling techniques to access illicit drug users online (Barratt and Lenton, 2010, cited in Barratt et al., 2017). In the current study, the inclusion criteria stated that participants were required to have personal experience with benzodiazepines thus, it was hoped that participants could provide valuable information and insights on the topic in question (Denscombe, 2010). Participants were expected to have taken at least one benzodiazepine in their lifetime. This was made clear on the participant information sheet (see appendix 15), and written on the posts on social media sites and forums which will be discussed throughout the next section. As the screenshot below illustrates, it was made clear that although motivations for use may be different, anyone with past or present benzodiazepine use could take part:

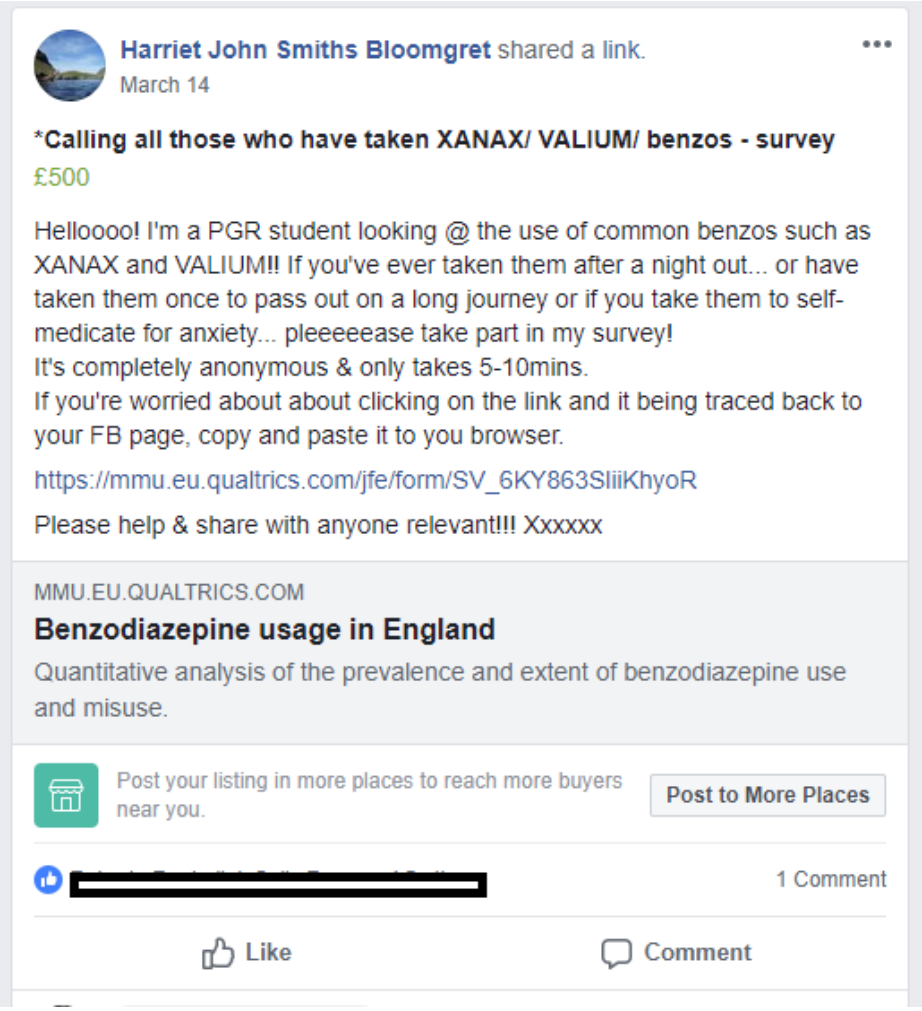


Image 2: Screenshot of Facebook post no.2 (on 14/03/2018)

Referring to the media coverage of benzodiazepine use and misuse in the UK, it became apparent that the dominant group of users were non-prescribed, young people, aged 11 – 25 (see Chapter Two: section 2.4.1). Therefore, certain language was adopted in order to make the survey relevant and understandable by the prospective participant group (Sue and Ritter, 2012). The researcher included the different street names, for example Diazepam (Valium) and Alprazolam (Xanax). The shortened terms 'benzos', 'vals' and 'xans' were also adopted after discovering the abbreviations in music lyrics (see Chapter Two: section 2.4.2). *Facebook* was used in order to reach the young adult population in the UK. The following section will explore the use of *Facebook* and other social media sites as a means of survey distribution.

3.3.4 Survey distribution

In order to obtain as many survey respondents as possible in the time given, the researcher was extremely proactive with methods of distribution. Using the internet and social media as a means of survey distribution was an efficient and cost effective way of accessing a geographically dispersed pool of respondents (Holmes, 2009; Suri and Patel, 2012; O'Connor et al., 2014; Wolfe et al., 2014; Whitaker et al., 2017), thus the dominant method of survey distribution in the current study was via *Facebook* and *Twitter*. Should they wish, *Facebook* users were able to share the post to their online network, *Twitter* users were able to re-tweet and private messages and emails were forwarded to relevant people. In research context this is named the snowball sampling technique (Olsen, 2012).

The arguably go-to sites for distributing sociological and criminological research concerning drug use are the popular online blogs namely *Reddit* and *Bluelight*. These were initially chosen to access other benzodiazepine users, not just the student population. See appendices 16 and 17 for screenshots of both the *Reddit* and *Bluelight* posts.

However, as the survey was still active, it became apparent that a significant amount of respondents resided overseas. It was assumed that the *Reddit* and *Bluelight* postings were responsible for this unintended survey response as the international blog forums can be accessed by anyone across the globe. Of the 771 respondents, 100 came from outside of England and were therefore discarded in the subsequent data cleaning and analysis. Thus, the survey was primarily distributed online using *Facebook* and *Twitter*. However, other methods were also utilised: sending out emails and private messages, handing out leaflets and putting up posters containing a QR code, and writing in an article in a student newspaper and attaching the survey link.

In total, 89 separate *Facebook* posts were made, alongside six individual tweets. Posts and tweets were often shared or re-tweeted, which significantly increased the number of those exposed to the survey link, which will be explored in the following section. A total of 250 leaflets were distributed across Greater Manchester including the survey QR code. The link was actively distributed and promoted between 1st March 2018 and 24th April 2018, and the survey was closed on the 8th June 2018. A screenshot of the one of the first *Facebook* posts is displayed below.

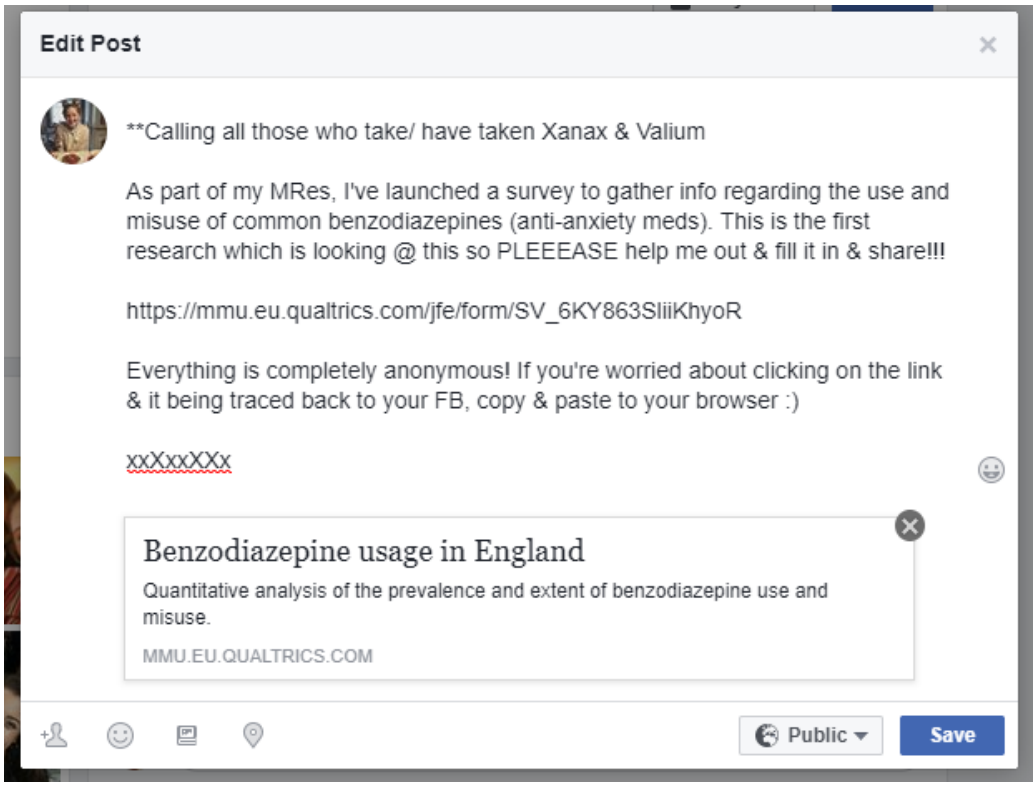


Image 3: Screenshot of Facebook post no.1 (01/03/2018)

The following section outlines and reflects on each method in more depth, including dates and times of postings and screenshots or snippets of the text.

3.3.4.1 *Facebook*

Facebook is a well-known networking platform where members can post life updates, queries, seek advice or search for local events and activities. Statistics reveal there are approximately 1.47 billion daily active users (Facebook, June 2018), and it was seen as a useful tool to access a vast number of potential participants. In addition to drawing on methodological textbooks and previous studies, the unique research design was also informed by the researchers partial insider status of being a student in Manchester from the ages 18 – 22 and gaining inside knowledge about students' social media habits. The researcher was able to join relevant *Facebook* groups to target the UK student population and was mindful of the best time to post. This meant relevant data could be collected quickly from competent participants, as some researchers have previously stated:

> *'Knowing about fieldwork means knowing what it like is to be in the field'*

(Miller and Tewsbury, 2001:89)

> *'Really in-depth research requires informed informants, not just responsive respondents'*

(Bernard, 2011:143)

It was known that for those attending Manchester Metropolitan University (MMU), Manchester School of Art (MSoA), University of Manchester (UoM), Salford University, Royal Northern College of Music (RNCM) and BIMM Music College, there are designated *Facebook* pages. For example, for MMU there is a closed group page named 'Manchester Metropolitan University Freshers 2017/18', where new students can ask questions freely about the University process, enquire about or discover suitable accommodation and discover new social networking events happening within MMU or across the city. Another well-known *Facebook* group is 'Fallowfield Students Group (FSG)', which is inclusive of University students across Greater Manchester, and is managed by students. Image 4 displayed below shows a snippet of the bio.

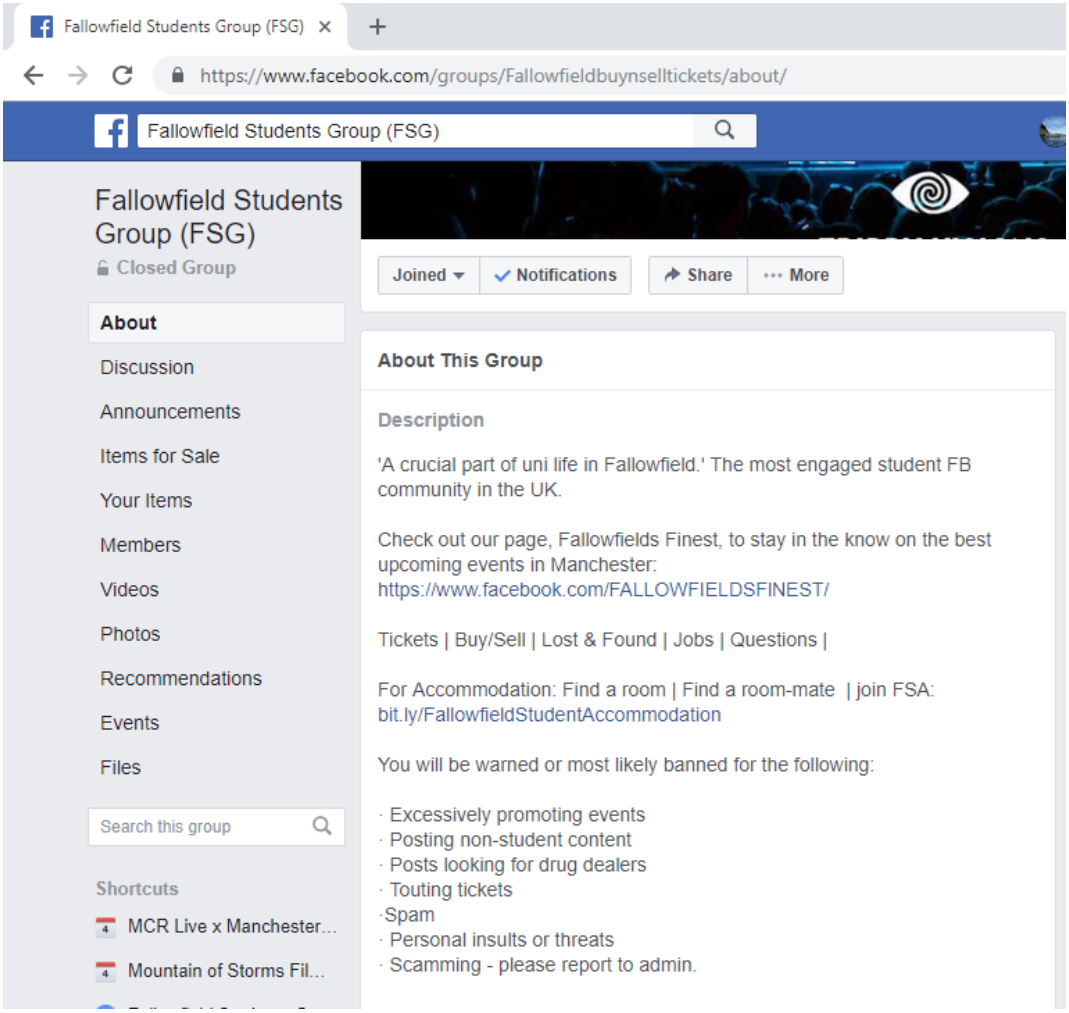


Image 4: Screenshot of Fallowfield Students Group Facebook bio

Similar to the MMU freshers 17/18 page, this group is popular for finding accommodation, re-selling nightclub tickets, rehoming household items and general rants about local pub doormen. With almost 31,000 members (Fallowfield Students Group, *Facebook*, as at 31/07/2018), this page was seen as an important gateway for accessing a large number of the target population to complete the online survey.

In order to reach out to the whole of the UK in order to provide generalisable data, the researcher referenced back to question five of the survey (see appendix 13) and produced a list of major cities in the UK. By adopting the cluster sampling technique (Sue and Ritter, 2012), specific geographical locations were targeted via *Facebook*. With adequate links to individuals attending separate universities across the country, the researcher contacted family, friends and acquaintances based in different cities to acquire knowledge and gain access to relevant *Facebook* groups. Similar to the unique *Facebook* pages for Manchester students, it was discovered that other cities had similar

Facebook pages and groups such as 'Leeds Uni Tickets' (Leeds), 'Clifton and Stoke Bishop Tickets' (Bristol) and 'Official UAL Freshers' 2017 – 18' (London). The main group which was found in the majority of cities was 'Overheard at XX'. This online community was not purely inclusive of students but also other *Facebook* users, which increased the likelihood of gaining participants of varied characteristics and therefore increasing generalisability beyond the university student population. Upon discovering the names of different *Facebook* pages, it became apparent that the majority were private, member-only groups. It was necessary to complete a small number of questions regarding the researchers' intentions to gain exclusive membership. The researcher was able to gain access to groups in the following cities: Bath, Birmingham, Bournemouth, Bristol, Cardiff, Coventry, Durham, Edinburgh, Exeter, Hull, Lancaster, Liverpool, Leeds, Leicester, London, Manchester, Newcastle, Nottingham, Plymouth, Salford and Sheffield. A full list of the names and links of the *Facebook* pages and their geographical location is available in appendix 18. Access was rejected from 3 groups without a justified reason.

The link to the survey was posted on six separate occasions from 1st March – 23rd April 2018, to a total of 41 different *Facebook* pages (not including the researchers personal *Facebook* page). See below for a map of the number of *Facebook* sites posted to in which region.

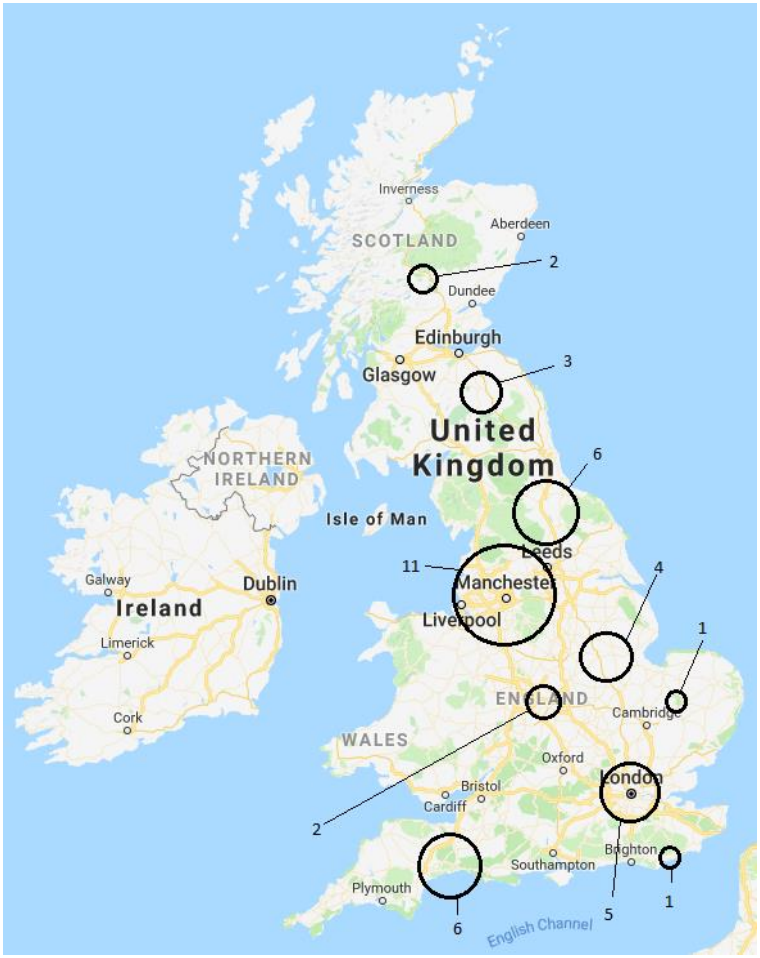


Image 5: Number of Facebook pages posted to by city

Certain posts included images in order to capture individuals' attention as they scrolled through. See appendices 19 – 24 for a full list of the *Facebook* pages, details of the time and date of each post and screenshots of the post.

The following sub-section will review the success of the distribution methods used with regards to how many participants were gathered on each day.

3.3.4.1.1 Lessons learnt

After trial and error and reflection, it was discovered that the most popular time of day to post was in the evening (6 – 10pm), on a Sunday or a Monday. Students were unlikely to be scrolling through *Facebook* on a Friday and Saturday night as it was assumed they would be out socialising, or the *Facebook* pages would be inundated with members seeking to buy or sell a variety of nightclub tickets. Students were also unlikely to see the post on *Facebook* on Wednesdays due to sports fixtures taking place.

It was noted that following a post on Monday the 26th March, there was a steep rise in survey respondents. Reasons for this may be that it was during the Easter break which meant students were most likely at home with their family and boredom equated to scrolling through *Facebook*. Another key point is that the pages were not swarmed by ticket selling posts, making way for other posts.

3.3.4.2 *Twitter*

Alongside *Facebook*, *Twitter* is a popular social networking and news sharing site, where users convey thoughts and communicate in brief messages called tweets. It is popular for microblogging where people of all ages can express thoughts and life updates alongside academics sharing vast knowledge about their field of expertise (Fenner et al., 2012). Tweets can be liked or re-tweeted, which increases the number of individuals who are able to see it and reply (ibid). For the current study, *Twitter* was used to target the academic and professional community. The first tweet (see below for a screenshot) with the survey link was sent out on the 1st March 2018 at 11.49am:

Image 6: Screenshot of Tweet no.1 (01/03/2018)

In contrast to *Facebook*, it was deemed best to tweet during the day when academics were actively involved in discovering new research papers or articles and sharing them via *Twitter*. The original tweet received 10 re-tweets from criminologists and researchers across England. Their followers were then able to see the tweet, which increased interest (O'Connor et al., 2014). Table 8 below includes a handful of *Twitter* users who retweeted the original post, and the number of their followers who could see it.

***Twitter* user**	**Number of followers (as seen on 10/09/2018)**
Harriet Bloomfield: (@HarrietBloomfi2)	68
Mark (@DRBristol71)	1,637
End Prohibition (@afterprohibends)	2,211
Henry Fisher (@_Hydroflouric)	2,610

Table 8: Those exposed to Tweet no.1

According to table 8 above, at least 6,226 people were exposed to tweet no.1. However, this led to professionals in the field of drug use such as Henry Fisher – Drug Policy Think Tank Volteface – tweeting a separate post with the survey link which received 10 re-tweets, including Fiona Meesham – Professor of Criminology, ACMD member and founder of The Loop – who has 4,441 followers (as at 10/09/2018). On the 7th March 2018, Harry Shapiro – director of DrugWise – sent out a call for research which the researcher saw and responded:

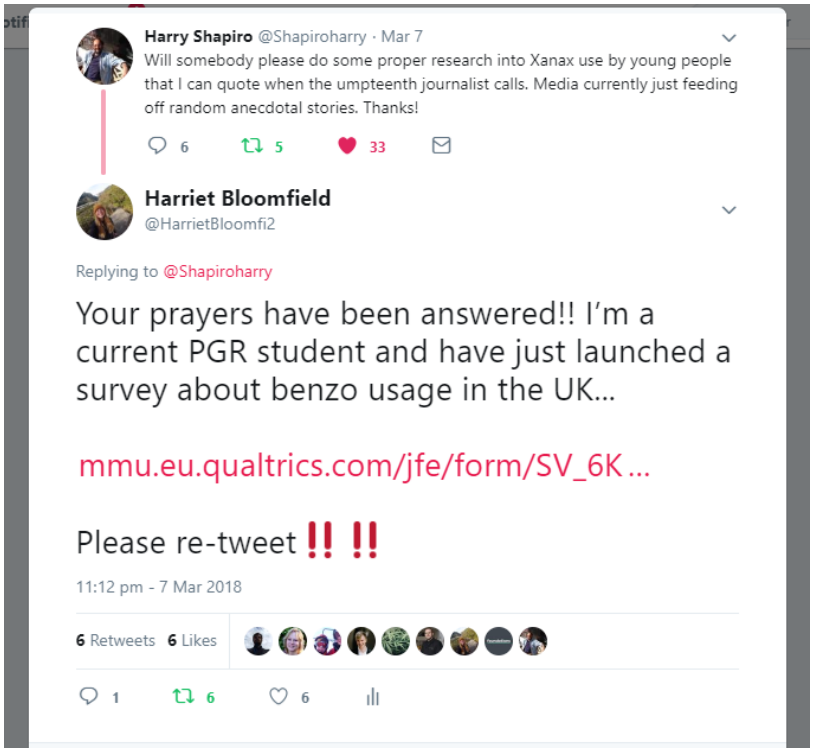


Image 7: Screenshot of interaction with Harry Shapiro via Twitter

Max Daly, a *VICE* journalist, also tweeted the survey link at the end of March which was visible to his 7,956 followers (as at 10/09/2018), which was re-tweeted by Hannah Rose Ewens, also a *VICE* journalist, who has over 18,000 followers (ibid). On the same day as the tweet by Max Daly (27/03/2018), 108 new responses were recorded. The number of responses along with the dates and times of postings will be elaborated further in section 3.3.4.5.

These interactions were identified as extremely important, as the link was seen by a significant number of people, thus increasing the likelihood of gaining more participants. Print screens of all tweets can be found in appendices 25 – 30.

3.3.4.3 *The TAB* Newspaper article

In order to spread knowledge of the survey and gain more participants, the researcher decided to target the wider Manchester student population through publishing an online newspaper article. *The TAB Newspaper* is popular amongst students in the UK, where readers can discover lengthy reviews about local takeaways (The Tab, 2018a), discover life as a University fresher (The Tab, 2018b) and the cheapest cocktail bars in Manchester (The Tab, 2018c).

Including a handful of statistics, the self-composed article consisted of benzodiazepine pharmacological information and the dangers of poly-drug use and counterfeits. The academic literature was coupled with quotes from users who were well acquainted with the researcher. See appendix 31 for the short interviews. Full consent was given and the individuals were anonymised and given a pseudonym (adhering to ethical guidelines, see section 3.4.2.1). Pictures used in the article were taken by the researcher and did not expose any identities. The article was titled: '*We asked Manchester students about their experiences with Xanax and Valium'* and can be found here (see The Tab, 2018d).

See appendices 32 – 34 for a full copy of the published article alongside screenshots.

3.3.4.4 QR code leaflets

In order to increase the number of survey respondents and to also appeal to those who are not necessarily active on social media, information about the research was also physically printed onto leaflets which were distributed around Manchester (see below).

Image 8: Leaflet containing QR code

The leaflet was made by the researcher with assistance from a Leeds based graphics student and an order was placed with solopress.com. Similar to the social media posts, the leaflet appealed to anyone who had taken at least one benzodiazepine in their lifetime, for whichever reason. Attached to it was a QR code which could be scanned using a smart phone camera.

Due to the researcher residing in Manchester and lacking in time to travel elsewhere, the majority of the leaflets were distributed in popular bars and cafes around the Northern Quarter and Ancoats. A handful were pinned to notice boards and bus stops in highly student populated areas such as Withington, Fallowfield, Rusholme and near UOM, RNCM and MMU. They were also distributed to people in popular bars and pubs in Fallowfield and taped to bathroom doors.

3.3.4.5 Survey distribution overview and response rates

Where and when the survey was distributed played a key factor in the number of responses. The days with the most response rates (over 10 responses on one day) are displayed in the table below. There was a continuous flow of responses even on days where the link was not posted onto any sites. This meant that original *Facebook* posts and tweets were still visible online and offline even days after posting.

Date	Where the link was posted	No. of responses
01/03/2018	*Facebook*: 6 pages *Twitter*: Harriet Bloomfield (10 re-tweets)	20
02/03/2018	Nothing posted – overflow from the previous day	31
13/03/2018	*Twitter*: Harriet Bloomfield replying to Hannah Ewens	10
26/03/2018	*Facebook*: 16 pages	86
27/03/2018	*Twitter*: Max Daly (2 re-tweets)	108
28/03/2018	Nothing posted – overflow from the previous days	32
29/03/2018	Nothing posted – overflow from the previous days	17
30/03/2018	Nothing posted – overflow from the previous days	13
01/04/2018	Nothing posted – overflow from the previous days	19
02/04/2018	*Facebook*: 9 pages	24
03/04/2018	*Facebook*: 16 pages	21
23/04/2018	*Facebook*: 37 pages	100
24/04/2018	*Twitter*: Harriet Bloomfield (10 re-tweets)	55

Table 9: Date and location of postings and number of survey completers

See appendices 19 – 30 for screenshots of each post and where it was distributed. See appendix 30a for a full table of dates of postings and response rates[11].

3.4 Qualitative methods – face-to-face interviews

Greene and McClintock (1985) highlight the importance of implementing mixed methods independently. This influenced the addition of semi-structured face-to-face interviews, which were inclusive of open-ended questions tailored to the interviewee. Similar to the quantitative methods, the interviews were conducted to discover:

- Which benzodiazepines are popular?
- Who is taking benzodiazepines?
- What are the motivations for use?
- What are the effects (both desired and undesired) of benzodiazepine usage?
- Where do users source their non-prescribed benzodiazepines?
- What factors influence benzodiazepine users' decisions on what benzodiazepines they use and where they obtain them?

Qualitative research methods enable the deeper exploration of a topic (Burnett, 2009) and thus in the current study, relevant quotes were extracted from interview transcripts in order to personify the copious amount of statistical data. One one-to-one interview (female, North West, age 31 – 40) was conducted alongside one focus group interview inclusive of 4 participants (all male, North West, aged 22 – 25). Initially, interviews were recorded on a voice recorder before being transcribed onto a Word document. The digital device offered high quality recordings and kept costs at a minimum (Kuckartz, 2014).

The following section will outline the research strategy for the face-to-face interviews (section 3.4.1), followed by an ethical discussion (section 3.4.2) specifically: participant confidentiality (section 3.4.2.1); protection from harm (section 3.4.2.2) and; participant information sheet and consent (section 3.4.2.3). Section 3.4.3 will discuss the sampling and recruitment tactics.

3.4.1 Research strategy and development

Qualitative research is known to generate rich, descriptive data (Burnett, 2009), and employing a semi-structured design meant a variety of perspectives could be collected regarding the same topic

[11] It must be noted that these figures are before data cleaning and therefore n=720

of interest (Boyce and Neal, 2006). Interviewing individuals of different ages and backgrounds about their drug use habits and their perception of drug policies can pose as very useful and influential for the wider society and of course, policy makers (Järvinen-Tassopoulos, 2017). Qualitative research has been described as an '*elaborate alibi to justify the exercise of power'* (Cohen, 1988:5 cited in Jupp et al., 2012).

Initially, survey data was briefly analysed which created broad themes (analysis will be discussed in section 3.5). By adopting Greene et al.'s (1989) methods of *development* and *expansion*, specific themes extracted from the survey results were used to loosely shape the interview design. The addition of face-to-face interviews meant that this research was able to gain a more contextual illustration of drug use habits (Jick, 1979), providing elaboration (Rossman and Wilson, 1985). The lack of static structure encouraged spontaneity, and questions were modified with correspondence to the participant in question (Mack et al., 2005; Burnett, 2009). Visible social cues such as body language and intonation assisted with this (Opdenakker, 2006). For example, if the participant had stated *former* heavy usage of benzodiazepines, questions were tailored differently to those participants who were classed as *current* users. See appendix 35 for the interview guide.

An advantage of conducting group interviews is that multiple opinions regarding the same topic can be collected quickly and efficiently (Tracy, 2012) and the conversation may lead to the discovery of new topics or ideas (Barbour, 2008). In the male focus group, the initial plan was to interview only one sole male (P1). However, the interview was conducted in a living room where multiple others were situated and it soon unravelled into a group interview inclusive of three more males in their 20s (P2, P3 and P4). Murphy et al. (1992) believe that group interviews may lack validity as specific views may dominate the group and lead to conformity (cited in Barbour, 2008). In the current study however, P2, P3 and P4 chose to voice their opinions as they disagreed with P1, contradicting former beliefs of Murphy et al. (1992).

3.4.2 Ethical discussion

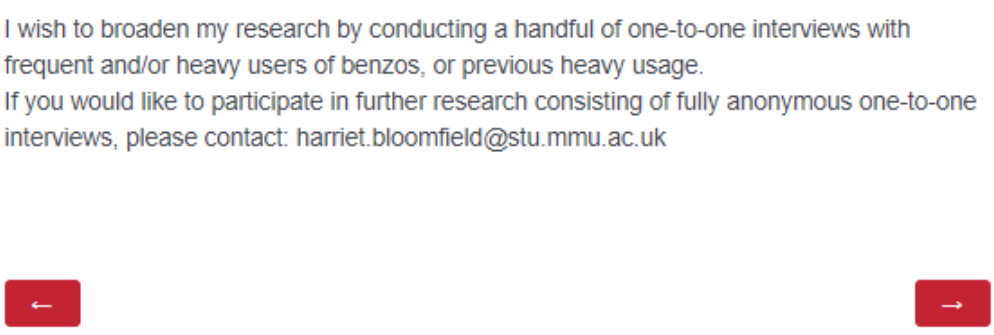
Similar to section 3.3.2, it was necessary to adhere to ethical guidelines to: ensure objectivity when collecting and analysing data; refrain from undue intrusion; ensure full anonymity and confidentiality of participants and; to minimise physical and psychological risk to field researchers and participants (Social Research Association, 2003).

3.4.2.1 Confidentiality

Data security and protecting personal information is an overarching ethical challenge when researching and collecting data in a sociological and criminological field in the digital era (see Aldridge et al., 2010). The leakage of personal data and transcripts could mean that individuals' illicit substance use could be exposed to the wider society and may incur legal repercussions (Liamputtong, 2007). Thus, participants in the current study were ensured that all data was secure and anonymised with compliance to the Data Protection Act 1998. The voice recordings were stored on a password-protected device, before immediately (within 2 hours) being transcribed to a document saved to a password-protected computer, which was only accessible by the researcher and supervisor (see Data Protection Act, 1988:50). Personal details such as name and exact age were removed and replaced with general references (Kuckartz, 2014), for example 'P1: male, North West, aged 21 – 25'.

3.4.2.2 Protection from harm

It was acknowledged that the nature of the interviews may seem to be pose as exceedingly intrusive (Social Research Association, 2003) and participants may have felt like their social values and privacy were disregarded (Hunter et al., 2012). Complying with ethical regulations are especially important when researching sensitive topics (Bryman and Bell, 2011) such as illicit substance use (Fox and Tracy, 1986) and mental health (Nyamathi, 1998) in order to protect the participant from psychological harm (Social Research Association, 2003). Due to the nature of the interview it was deemed best to conduct them in a private space (National Drug Abuse Treatment Clinical Trials Network, accessed on 13th May 2019). The invitation for further research stated that participants were required to have 'frequent and/or heavy' past or present benzodiazepine usage (see below for a screenshot). The terms 'frequent' and 'heavy' were left undefined. This was because individuals'



usage varies significantly and personal preferences and perception of 'little' or 'a lot' is too broad. Therefore, this decision was left to the participant.

Image 9: Screenshot of the invitation for further research displayed at the end of the survey

Therefore, it was expected that participants may be classed as 'vulnerable' (Silverman, 2013). Thus, the researcher employed sensitive terminology and proper research conduct in order to gain full trust and establish rapport (see Miller and Tewksbury, 2001) and to ensure the physical and psychological well-being of both the participant and the researcher (Liamputtong, 2007). The participant was debriefed after the interview and presented with organisations and helplines if they showed signs of concern (see 'General Interview Guidelines', National Drug Abuse Treatment Clinical Trials Network, accessed on 23rd October 2018).

The researchers' personal safety was also noted and they may have been at risk during the interviews as the participant may become violent as a consequence of feeling distressed (Lee, 1995). Psychoactive substance use is highly stigmatised (Room, 2005), and individuals may have felt distressed and shown levels of guilt, embarrassment and worthlessness (British Society of Criminology, 2015). Another added risk is that the researcher was a lone female (Social Research Association, 2003). Thus, the researcher made at least two people aware of the date, time and location of interviews for safety purposes (National Drug Abuse Treatment Clinical Trials Network, accessed on 13th May 2019).

3.4.2.3 Information sheet and consent

Participants were made aware of the nature of the interview and possible sensitive topics that would be discussed prior to the interview: they were required to read and acknowledge the information sheet (see appendix 36) after which they were required to sign and date the form of consent (see appendix 37). Participants were ensured that they had the right to withdraw at any time, meaning all their data would be destroyed.

3.4.3 Sampling and recruitment

Purposive sampling increases the likelihood to gain competent participants (Tongco, 2007), therefore, interviewees were gathered via an email address at the end of completing the online survey. See image 9 above for the invitation for further research. A total of 12 individuals expressed an interest in taking part in the interviews. However, due to time restrictions and the unexpected high number of survey responses coupled with the level and detail of free text comments gathered

in the online survey, and the additional time spent learning chemical analysis techniques and carrying out forensic testing, this led to the decision to restrict the number of in-depth interviews for this project.

3.5 Data analysis

Using mixed methods in a single study did not only require intuitive data collection methods in order to keep it balanced (see Lopez-Fernandez and Molina-Azorin, 2014: 3 – 5), complex analytical skills were also needed to efficiently obtain useful, impactful data (Kuckartz, 2014). The following section will outline the analysis processes of both the quantitative and qualitative data.

3.5.1 Quantitative data – survey

Survey data was easily transferred to other statistical programmes which made it easy to correlate the findings (Rea and Parker, 2014). Initially, all responses (n=771) were transferred to Excel for cleaning. Unreliable and untrue answers such as extreme exaggeration and/or abusive or inappropriate comments were deleted (see screenshot below for examples). Unfinished surveys and responses from those who resided outside the UK were also discarded. Cleaned data (n=595) was then transferred to SPSS for coding. A detailed document of how each question was coded is available in appendix 38.

Recorded Date	Q1 - Age	Q2 - Sex	Q2 - Sex - Other (please state)	Q7 - Which benzo(s) have you taken? (You may chose multiple answers)	Q10 - Why is this your benzo of choice?	Q14 - Please comment with the type of benzo you'd take, which milligram/ microgra...	Q16 - Please briefly describe a memorable encounter involving benzos. In what con...
Mar 1, 2018 10:16 PM	41+	Other (please state)	40% M 60% F	Valium (Diazepam), Xanax (Alprazolam), Ativan (Lorazepam), Klonopin (Clonazepam), Tranxene (Clorazepate), Librium (Chlordiazepoxide), Estazolam, Other (please state)	cause it's fucking sickkkk	as much as I can to forget the war	Forgot my name and that I live in manchester
Mar 1, 2018 10:14 PM	41+	Other (please state)	Alien	Valium (Diazepam), Xanax (Alprazolam), Ativan (Lorazepam), Klonopin (Clonazepam), Tranxene (Clorazepate), Librium (Chlordiazepoxide), Estazolam, Other (please state)	shes cheap and nasty	valium to fuck ur mom, xanax to fuck ur mom, ativan to fuck ur dad, klonopin to fuck u whilst u sleep, tranxene to fuck myself whilst i sleep, and finally librium on sunday after noons	when your mom came out her nose

Image 10: Screenshot of unreliable answers

3.5.2 Qualitative data – survey

Alongside the four open-ended questions, participants were able to contribute text responses alongside close-ended questions throughout the survey, by leaving 'other' or 'additional comments'. For example, when asking participants about benzodiazepine prices (see appendix 13: question 21), 64 respondents left additional text answers. Text responses were exported back to Excel and coded accordingly due to the amount of data obtained.

Altogether, the four free text questions received a total of 1,339 answers. The discussion of different benzodiazepines of different strengths and dosages, varied user motivations and multiple personal opinions were noted. All text was transferred to Excel to prepare for coding. It was evident that almost all responses were relating to Valium and/or Xanax, thus, others were discarded. Analysis methods were complex as opinions were broad and often contradicted one another. Methods of coding and themes will be outlined throughout this sub-section.

3.5.2.1 Q10: Benzodiazepine preference – 413 answers

Q9 asked 'what is your preferred benzo?' which was followed by a free text answer of 'why is this your benzo of choice?' (Q10). The latter received 413 answers. To begin with, Q9 was coded into numerical data on SPSS, after which answers specific to Valium from Q10 were extracted and transported to Excel. After reading the copious amounts of free text, common themes emerged. Headings were created and different quotes were assigned accordingly: 'cost', 'accessibility/only one I have used/it is prescribed', 'enjoy the relaxing/anti-anxiety effects', 'it aids sleep', 'no/little/less side effects from Valium', 'Xanax effects= BAD: too strong/memory loss &black-outs'. Headings were different for those who chose Xanax as their preferred benzodiazepine: 'easy to obtain/popular', 'good mix with alcohol', 'stronger & better value for money', 'fast onset and shorter half-life', 'good for anxiety', 'good for sleep', 'good for comedowns', Valium=BAD'. Screenshots of the coding in Excel can be found in appendix 39 and 40. This free text was used in the results section (see Chapter Four: section 4.7).

3.5.2.2 Q14: MG and dosage context – 385 answers

Q14 was a very broad, thus it received copious amounts of variety and analysis was complex. See a screenshot of Q14 below.

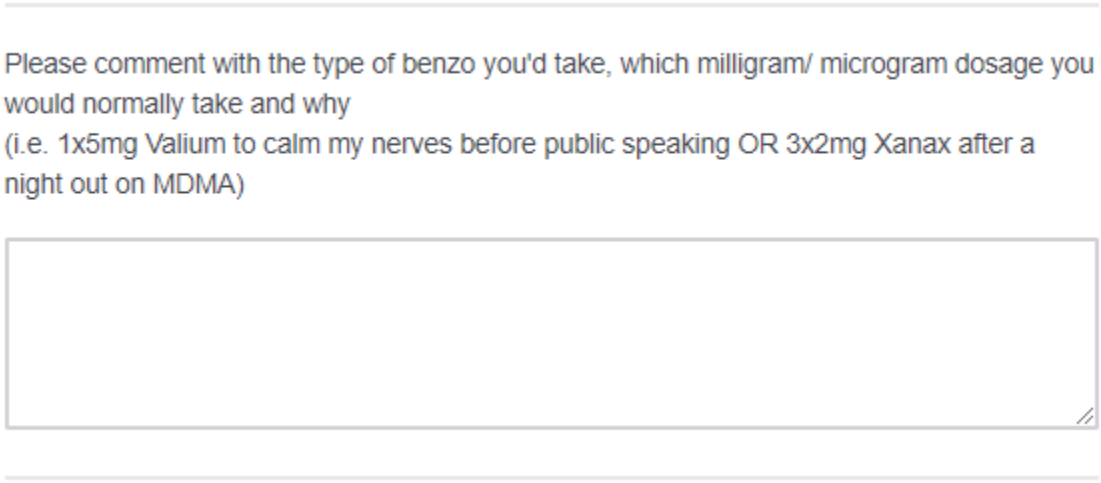


Image 11: Screenshot of question 14 from the online survey

Data was initially split into two separate excel files: Valium and Xanax, before responses were coded further (see appendix 41 for a screenshot). With reference to user motivations explored in Chapter Two: section 2.6, pre-codes were used to initially categorise each quote. Valium responses (n=162) were split into three separate headings: 'anxiety/insomnia', 'recreation – to get high' and 'recreation – to come down' (see appendix 42 for a screenshot). The categories were then split further into common milligrams (2 mg, 5 mg, 10 mg, 15 mg, 20 mg or 30 mg) and dosages (1 – 10 tablets) and mentions were tallied separately. Xanax responses (n=159) were split differently. Four themes were inclusive of: 'anxiety/insomnia', 'to get high/feel more intoxicated', 'after a night out/counteract stimulants/psychedelics' and 'to cure hangover/come down'. It was noted that milligrams ranged from 0.25 mg – 8 mg and dosages ranged from 1 – 5 bars corresponding to user motivations. Analysis for the Valium category was time consuming and tedious, thus, Xanax answers were not categorised as above. Some text answers were used throughout the results chapter to amplify or counteract other data.

3.5.2.3 Q16: Memorable encounter – 422 answers

It was decided to include a free text answer which enabled participants to describe a memorable encounter involving benzodiazepines to gain a deeper understanding of user habits (see appendix 13: question 16). Common themes were already established due to mimicking the survey design, thus answers from Q16 were assigned to relevant sections throughout the results write-up.

3.5.2.4 Q23: Why benzos? – 119 answers

Q23 influenced the exploration of substance use replacement. Alongside producing statistics, some respondents (n=119) left additional comments. As this number was significantly less, answers were not formally coded. Relevant and dominant quotes were used to enhance the statistical data from Q23.

3.5.3 Qualitative data – interviews

The interview script was sculpted after establishing common themes from survey answers, and interview data was analysed after the survey data. Thus, coding the qualitative interview data was simple, and relevant and useful quotes were used to clarify and/or elaborate survey data.

3.6 Reflections and limitations

The following section will highlight the limitations of the research methodology used. Upon cleaning, the researcher had to discard a total of 176 survey responses. Despite being mindful of the need to design a quick and easy survey (Sue and Ritter, 2007) that could be completed within 5 – 10 minutes, a handful of respondents exclaimed that the survey was too long and became boring. A total of 53 surveys (6.8% of all data before cleaning) were started and not fully completed and therefore deleted. Moreover, as explored in previous chapters, social media platforms and online forums are available for anyone (Ngai et al., 2015), and online distribution methods meant information reached beyond the desired target sample, in this case, to non-UK residents. A total of 100 respondents came from overseas, therefore their answers were invalid. Furthermore, granting participants with a masked online identity may encourage false and unreliable responses (Lefever and Matthíasdóttir, 2007). A total of 23 responses were deleted as the answers were deemed unreliable due to enclosing the use of excessive amounts and/or included abusive comments (see section 3.5.1: image 10). The impact of this with regards to further research will be discussed in Chapter Seven.

A major concern and limitation of using *Qualtrics* was that the identities of the survey participants were not totally anonymous. The GeoIP address was recorded for each respondent (see below for screenshots). This fault lies with the online survey software and is out of the researchers' control. Nevertheless, it limited the level of confidentiality and anonymity that the researcher could offer to participants compared to other methods of survey administration such as face-to-face or postal administration.

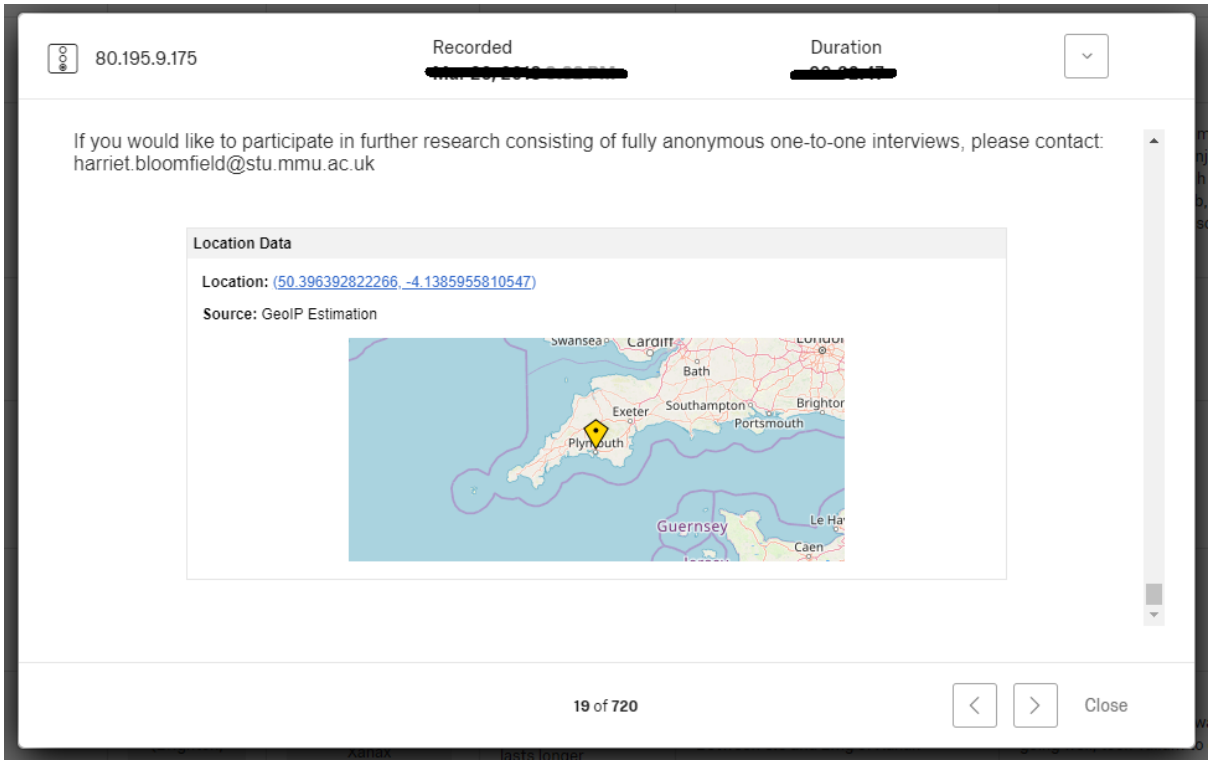


Image 12: Screenshot of GeoIP address displayed at the end of the survey

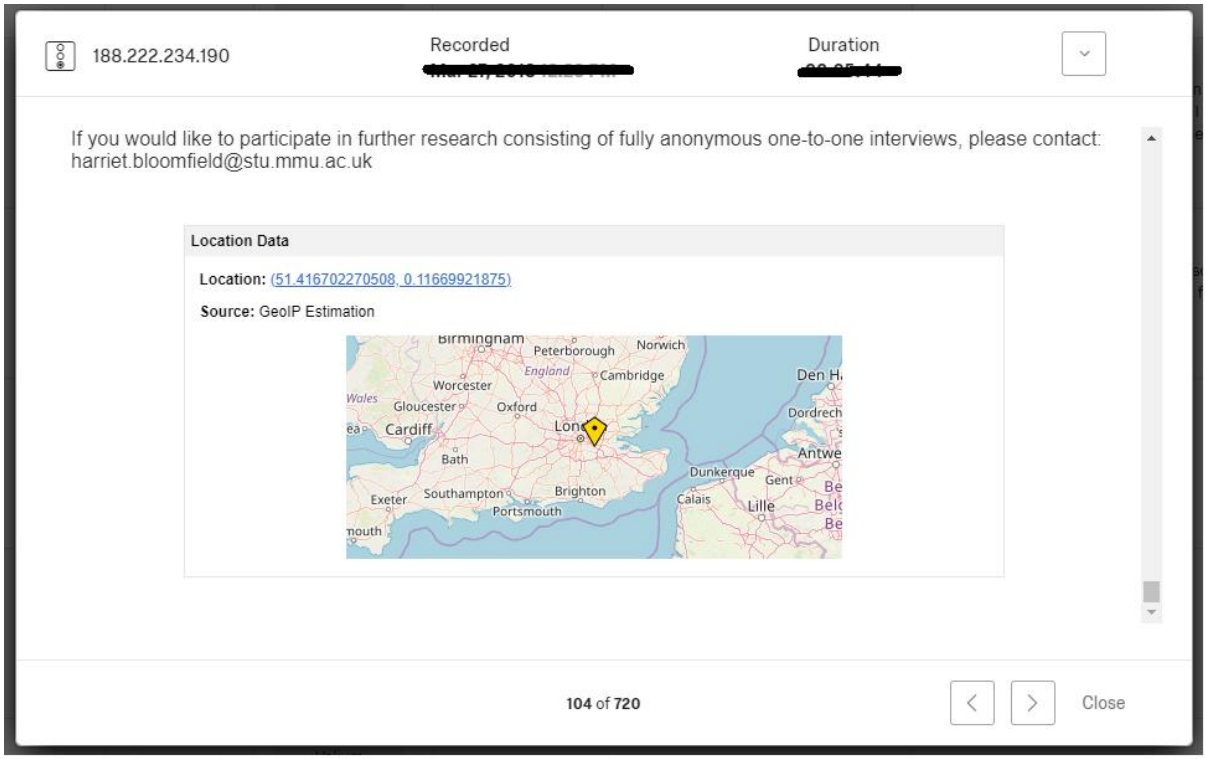


Image 13: Screenshot of GeoIP address displayed at the end of the survey

An additional limitation of the research methods employed was the lack of generalisability. Due to predominantly targeting the student population via specific *Facebook* groups, the sample consisted of primarily university students aged 18 – 25. The Manchester population was also dominantly targeted online and offline. Due to limited time and financial resources, the QR code leaflets were only distributable in Greater Manchester, and the code was only accessible with a smartphone. Due to being situated in Manchester and being conscious of time and costs, survey and interview participants were dominantly from the North West of England and therefore, this skewed the sample. It would be useful to replicate the study in other popular student areas and cities for example in Bristol, Leeds and Sheffield, following the same methodology displayed in this chapter.

Moreover, four respondents did not wish to enclose their geographical information, however due to traceable GeoIP addresses displayed by *Qualtrics*, it was known that they resided in the UK. In hindsight, this question should have been made compulsory to ensure every participant was from the UK. Another minor limitation of this research was that the email address attached to the QR code leaflet was a personal email address. This should have been a University email address for professionalism.

Not only is the researcher required to possess complex sampling and analytical skills in order to successfully process statistical and textual data for the same phenomenon (Bernard, 2011), analysing answers to open-ended questions can extremely time consuming (Burnett, 2009) and as stated towards the beginning of this chapter, employing a mixed methods research design requires higher levels of effort and time (Adowitz and Toole, 2010). This was negatively reflected in the small number of interview participants. Between the beginning of March and the middle of April, a total of 12 individuals aged 20 – 44 individually approached the researcher via email and *Facebook*, expressing an interest in participating in further research. However, as stated in section 3.4.3 the unexpected high number of survey responses coupled with the level and detail of free text comments gathered in the online survey, alongside the additional time spent learning and applying chemical analysis techniques and carrying out the forensic testing led to the decision to restrict the number of in-depth interviews for this project.

3.7 Summary of chapter

To summarise, this chapter clearly justified the use of a mixed methods approach in order to efficiently collect and analyse quantitative and qualitative data regarding individuals' benzodiazepine use and misuse. Inside knowledge of young people's social media habits enabled rich data collection. Using *Facebook* and *Twitter* proved to be highly effective to access nationally dispersed participants,

and it is recommended that this method of participant recruitment is used in further research. *Facebook* can be useful when targeting the student population, however, due to their busy social lives, it was essential to post at a time when the networking pages were not swarmed with ticket selling posts and other queries. It was discovered that the best time to post was on Monday evening and outside of term time. *Twitter* proved to be useful to target the academic and professional population. Re-tweeting meant that more *Twitter* users were exposed to original tweets, thus gaining more survey participants with varied demographics.

The traditional recommendation of conducting interviews in a public space when discussing drug use topics with potentially vulnerable participants was rejected in the current study. Interview participants did not want other citizens to possibly overhear sensitive information and the discussion of illicit activity which may have led to stigmatisation and/or legal repercussions. It was vital that other measures were put in place to ensure the full safety of both parties. This must be acknowledged by future researchers.

The next chapter will outline the results from the survey and the interviews.

Chapter Four: Sociological Results

4.1 Introduction and chapter overview

This chapter presents the quantitative and qualitative findings from the online survey (inclusive of 595 respondents) and from the semi-structured interviews (five participants). Statistical data will be coupled with qualitative textual data to enhance the findings and help clarify each theme. All the percentages used throughout this chapter represent the findings from the survey data. It is important to note that other than demographic information, survey respondents were able to choose multiple answers. Thus, percentages do not always equate to 100.

In order to stay concise, the following chapter will mimic the layout of Chapter Two. It will begin by stating participants' demographic information (section 4.2), specifically: gender, ethnicity, age, occupation, and region in the UK. Section 4.3 will then outline the type of benzodiazepines being used and frequency of use. Section 4.4 will examine ease of access, availability and the cost of Valium (section 4.4.2) and Xanax (section 4.4.3). The diverse range of user motivations will be presented in section 4.5 which ranges from: needing them to sleep (section 4.5.1); self-medicating anxiety-related issues (section 4.5.2); to relax (section 4.5.3); to get high, mostly in conjunction with other drugs (section 4.5.4); to counteract other drug effects (section 4.5.5) and; to avoid hangovers and/or comedowns (section 4.5.6). Their sometimes overlapping and intertwining uses will be explored in section 4.5.7, before exploring substance use replacement as an explanation for the recent spike in usage (section 4.6). Dosage and routes of administration were closely linked to user motivations which will be discussed throughout this chapter. Section 4.7 will examine users' preference of benzodiazepine, specifically: Valium (section 4.7.1) and Xanax (section 4.7.2) before highlighting some contradictory points (section 4.7.3). Section 4.8 will go on to explore participants' accounts of adverse negative effects on the brain and behaviour, including: feeling overly-sedate which leads to the impairment of psychomotor skills (section 4.8.1); black-outs and memory loss (section 4.8.2); paradoxical stimulation and feeling 'invincible' (section 4.8.3); accidents and injuries (section 4.8.4); emotional blunting and depression (section 4.8.5); tolerance, dependency and withdrawal (section 4.8.6) and; mortality (section 4.8.7).

Raw SPSS data can be found in appendix 56a and 56b.

4.2 Participant demographics

The majority of respondents were male (n=326, 54.8%), 263 were female (44.2%) and one respondent was transgender. Over four-fifths of respondents were heterosexual (n=498, 83.7%), 68 were bisexual (11.4%) and 18 were homosexual (3%). The majority of survey participants were white (n=529, 88.9%), 40 had a mixed ethnic background (6.7%), 14 were Asian (2.4%) and five were black (0.8%). Two participants were Chinese (0.3%), two were Arabic (0.3%) and one was Hispanic (0.2%).

As expected due to survey distribution techniques (see Chapter Three: section 3.3.4), four-fifths of survey respondents were full- or part-time students (n=492: 82.7%). Others were employed (n=89, 15%), unemployed (n=7, 1.2%) or 'other'[12] (n=3, 0.5%). Thus, the vast majority were of typical student age: over two-thirds of respondents were aged 18 – 21 (n=422, 70.9%), one-fifth were aged 22 – 25 (n=127, 21.3%) and the rest were 26 and over (n=46, 7.7%). Due to predominantly targeting Greater Manchester online and offline (see section 3.3.4.1: image 5 and section 3.3.4.4), the majority of the respondents resided in the North West of England (n=170, 28.6%). 16.8% came from London (n=100), 14.3% from the South West (n=85) and 10.8% from Yorkshire and the Humber (n=64). Other survey participants came from the East Midlands (n=35, 5.9%), the South East (n=33, 5.5%), the East of England (n=26, 4.4%), the West Midlands (n=26, 4.4%), Scotland (n=25, 4.2%), the North East of England (n=18, 3%), Ireland (n=5, 0.8%) and Wales (n=4, 0.7%). These figures are illustrated on image 14 below. Four participants (0.7%) preferred not to disclose their home region. However, due to traceable IP addresses (as discussed and displayed in Chapter Three: section 3.6), it was evident these respondents were from the UK (or were at the time of survey completion) therefore these 4 responses were not deleted. Their wish to not state their home region was respected and thus the figures displayed on the map below equate to 591.

[12] 'Other' = unable to work, retired, a homemaker

Image 14: Map of the UK with number of respondents from specific regions

4.3 Type of benzodiazepine and frequency of use

In total, respondents spoke of 33 different types of benzodiazepines. However, two in particular dominated the research findings: the majority of respondents had tried either Valium (n=499, 83.9%) and/or Xanax (n=481: 80.8%) at some point in their lifetime. Some respondents had also tried Klonopin (n=61, 10.3%), Ativan (n=47, 7.9%), Estazolam (n=36, 6.1%) and Etizolam (n=30, 5%). 5.1% of respondents had tried 'other'[13] benzodiazepines (n=31). For recent usage (in the past 2 months[14]), respondents had used Xanax more than Valium. Over half (n=313, 52.6%) had used Xanax in the last

[13] 'Other' = Bromazepam, Brotizolam, Clobazam, Clonazolam, Deschloretizolam, Desetizolam, Diclazepam, Flubromazepam, Flubromazolam, Flunitrazepam, Flunitrazolam, Flurazepam, Flutazolam, Librium, Meclonazepam, Medazepam, Midazolam, Metizolam, Nifoxipam, Nitrazepam, Oxazepam, Prazepam, Pyrazolam, Temazepam, Tranxene, Triazolam (Halcion) and 'other research chemicals'

[14] The survey ran from the 1st March 2018 – 8th June 2018 therefore 'recent usage' accounts for 1st January 2018 – 8th April 2018

2 months and 45.9% of respondents had used Valium (n=273). A third of respondents had not used them recently (n=181, 30.4%).

Generally speaking, both Valium and Xanax were used for a number of motivations which will be explored in section 4.5. However, reported rates of usage varied heavily, and this was closely linked to motivations for use.

> *'It varies with how the weeks going, sometimes you just want the day to end, sometimes you wanna get fucked up, sometimes you wanna go on a nice walk'*

(Male, student, North West, aged 22 – 25)

A third of survey respondents stated that they take benzodiazepines every few months (n=191, 32.1%). 14.8% take them every month (n=88), 14.1% take them every 2 weeks (n=84) and 15.3% of people said they take them weekly (n=91). 26 respondents (4.4%) take them daily, and 17 (2.9%) take them whenever they feel the need to.

> *'When I need it or when I feel like I should (to take the edge off... When realistically there are other ways to relieve the tension... I'm in denial and I tell myself it's to relieve tension when lowkey it's like a little treat for myself rather'*

(Female, student, Yorkshire and the Humber, aged 18 – 21)

> *'It really depends. I smoke weed, so if I'm anywhere where I can't smoke weed for the night, I would take Diazepam to help me sleep. I also like it after a night out. However, my nights out are minimal, so my usage can vary. I can go months without using and then maybe use 3-4 times in a fortnight'*

(Female, employed, West Midlands, aged 41+)

49 respondents (8.2%) said they rarely take them or have only done so once or twice, and a further 26 respondents (4.4%) had not taken them for a long time. Qualitative data was collected from 11 respondents (1.8%) who *'binge'*:

> *'Every couple months I have a fat binge, normally for about a month. Then I stop again'*

(Male, student, North West, aged 18 – 21)

'Sometimes benders come about where I end up going on a few days binge taking anywhere from 3 - 10 Valium a day. Then it can be months before I next take a benzo'

(Male, student, East Midlands, aged 18 – 21)

'I will go weeks without having any, but when I have a supply I am more likely to use them. So it'll be bursts of 2 – 3 times a week (particularly during stressful periods), followed by maybe a month without any at all'

(Male, employed, South East, aged 31 – 40)

The amount of benzodiazepines consumed on each occasion varied, and it must be noted that there are different dosages available (as explored in Chapter Two: sections 2.2.3.1 and 2.2.3.2), which were not defined in the question. Just over a fifth (n=125, 21%) reported to taking 1 Valium, almost a third (n=180, 30.3%) take 2, and 11.6% (n=69) take 3 on each occasion. An alarming 15 respondents (2.5%) consume over 10 Valium's on one occasion. 14 Xanax users claimed to take ½ a bar on each occasion (2.4%), over a third take 1 bar on each occasion (n=220, 37%) and a quarter take 2 (n=147, 24.7%). Others take 3 (n=42, 7.1%), 4 (n=21, 3.5%) and 5 (n=11, 1.8%). This was also directly linked to user motivations. Generally speaking, there was a mild variation between motivations for use and the amount of benzodiazepines consumed. This will be discussed further throughout section 4.5.

4.4 Access, availability and cost

4.4.1 Source

Survey respondents obtained their benzodiazepines from various sources. Over half acquired them through a dealer (n=340, 57.1%) and/or through a friend (n=316, 53.1%). Over a quarter claimed their purchases came from the dark-web (n=172, 28.9%), however there was no specific variation between Valium (n=153, 30.7%) and Xanax (n=163, n=33.9%). Other sources were through NHS prescription (n=75, 12.6%); diverted prescription (n=71, 11.9%); the clear-web (n=27, 4.5%); via a family member (n=22, 3.7%) and/or work or study colleague (n=22, 3.7%). A handful of participants said they obtained their benzodiazepines from overseas, primarily from Asia where they can often be bought over-the-counter.

Of those who obtain their benzodiazepines through a dealer, a fifth (n=113, 19%) stated it was the same dealer who supplies another CNS depressant drug: ketamine. 90 respondents said it was the same dealer who supplied cannabis (15.1%), however a fifth said their dealer dealt them benzodiazepines only (n=108, 18.2%). This will be discussed further in Chapter Seven: section 7.5.

Similar to Leclair et al. (2015), the current study has proven that the power of easy access and cheap prices can be a leading motivation for non-prescribed drug use, and it must not be underestimated. It may be accountable for substance use replacement: many said benzodiazepines are *'cheaper than alcohol'*.

> *'[Xanax is] cheaper than most drugs, therefore easier to buy more of and enjoy the relaxed feeling compared to other drugs available'*

(Female, student, East Midlands, aged 18 – 21)

This will be examined further in section 4.7.

The price of benzodiazepines varied greatly and was dependent on the source, as one individual said:

> *'Prices greatly depend on whether I buy from a street dealer (most expensive), from a friend who has usually ordered online (less expensive), or have ordered them myself (least expensive)'*

(Male, student, North West, aged 18 – 21)

The general consensus in the current study was that buying in bulk meant that Valium pills and/or Xanax bars would be significantly less in price. A third of users buy 1 – 5 benzodiazepines at a time (n=182, 30.6%) and a fifth buy 6 – 10 at a time (n=118, 19.8%). 12.9% (n=77) buy 11 – 20, 12.8% (n=76) buy 21 – 50 and 9.2% (n=55) buy over 50.

> *'Valium can range from 13p (bulk price, 500+) to a pound each individually. And Xanax can range massively because the powdered pure form of [Alprazolam] can cost £15 for 100 mg where as a 2 mg tablet can cost up to £2'*

(Male, employed, South East, aged 18 – 21)

'They're far too cheap and thus sold in large quantities, so, as stated, [I] end up taking too many'

(Male, student, North West, aged 18 – 21)

4.4.2 Valium (Diazepam)

The majority of Valium users claimed to pay £1 per pill (n=142). However a vast number do not pay (n=135), and some pay 50p (n=87), £1.50 (n=35), £2 (n=48) and £3 (n=14). However, other prices such as 15p per pill, 20p per pill and 30p per pill were noted.

4.4.3 Xanax (Alprazolam)

'Xanax prices vary depending on the strength/dealer. Dark web Xanax tend to be stronger but still cheap. Dealers usually charge more for stronger ones'

(Male, student, North West, aged 18 – 21)

The majority of Xanax users pay £2 per bar (n=141).

'Xanax [is] more expensive because it's stronger'

(Male, student, East Midlands, aged 18 – 21)

Others pay 50p (n=48), £1 (n=91), £1.50 (n=56), £3 (n=49) and £4 (n=13). A few individuals also stated they have once paid as little as 30p per bar, however one respondent stated once paying £5 for one bar.

'Price generally depends as Xanax price varies on the dark web, there was a time when you could get 50 x 2 mg Xanax bars for £30'

(Male, employed, North West, aged 22 – 25)

'Depends on the dealer but normally around 7 Xanax for £10'

(Male, student, North West, aged 22 – 25)

'£20 for 6 bars of Xanax. Cannot buy less at once'

(Male, West Midlands, student, aged 18 – 21)

However, some say they have in fact lost their reliable source, which has halted or slowed down their usage:

> *'Now that certain vendors and markets are down or busted it's virtually impossible to get Xanax on the darknet and be confident of its quality so I stopped'*

(Male, student, South East, aged 18 – 21)

> *'I used to be able to order them legally from chemicalwire.com, until they became illegal'*

(Male, student, North West, aged 22 – 25)

> *'[My usage] used to be more regular when they were easy to get a hold of'*

(Male, student, South East, aged 18 – 21)

> *'Xanax is … just that bit harder to source a good quality product and the fact it is never prescribed in England makes it that extra bit harder to get'*

(Male, employed, South East, aged 18 – 21)

135 respondents said they do not pay for Valium and 60 respondents said they do not pay for Xanax.

> *'My mate is always taking Vallies so he normally chucks [me] a couple if I'm worse for wear or if we [are] bored and chilling'*

(Male, student, North West, aged 18 – 21)

> *'I have only ever been given them by friends not made to pay'*

(Female, student, South West, aged 18 – 21)

> *'I got Xanax free with some other drugs I bought so I don't know the price'*

(Male, student, North West, aged 22 – 25)

4.5 User motivations

The following section will present the multi-functional use of benzodiazepines. Generally speaking, user motivations in the current study were similar to those identified in previous studies (see Chapter Two: section 2.6) which identified individuals using benzodiazepines to either self-medicate: sleep issues, for anxiety, or stress; to use them for recreational purposes: to relax, to get high, to heighten the effects of other drugs, to 'come down' or to completely eradicate the effects of stimulants. Evidence from the current study also discovered that some individuals use benzodiazepines to: relieve anxiety about flying; boost confidence before a presentation, job interview or before socialising with peers; perform well in high pressure periods like deadlines and exams; sleep on long journeys; counteract the stimulant effects of study drugs such as Modafinil; counteract unwanted hallucinogenic effects of psychedelic drugs; eradicate any negative physical or emotional effects of hangovers and/or comedowns; ease or eradicate physical pain and; to correct irregular sleep patterns.

> *'[Benzodiazepines] can be used for multiple reasons. Help you sleep, chill you out, cheap alternative for a night out, straighten you out if [you're] pranging due to other drugs (mainly psychedelics)'*

(Male, student, Yorkshire and the Humber, aged 18 – 21)

There was no significant difference between types of benzodiazepine used and user motivations. Both Xanax and Valium were used almost equally in a self-medicating and a recreational context. However, volume and dosages were clearly linked to user motivations, and dosage for those who used benzodiazepines in a recreational context generally doubled. Tolerance levels also varied significantly amongst participants thus every answer was different. Those using Valium took more than Xanax.

> *'I would [take] ½ [a Xanax] before public speaking. 1 to sleep or suppress stimulants (coke, MDMA) after a sesh. 1 or up to 2 depending on how I want to feel or how big the social event is (house party, going to a bar, a gig, dancing)'*

(Female, student, Yorkshire and the Humber, aged 18 – 21)

Routes of administration also revealed a direct link to user motivations and will be discussed throughout. Almost all (99.2%) of respondents usually swallow their benzodiazepines, however 96 respondents (16.1%) said they snort them, 10 (1.7%) consume them sublingually, four dissolve it in

their drink, one person chews them and another one has injected them. The latter five routes of administration were notably linked to recreational users, particularly those who used them with other substances. As highlighted in previous studies (see Rigg and Ibañez, 2010; Andersson and Kjellgren, 2017), the speed of onset of benzodiazepines is significantly heightened when they are snorted.

The layout of this section will mimic that of the literature review.

4.5.1 To get to sleep

Although the large majority of survey participants used benzodiazepines without prescription, their sedative properties were still praised and over half of respondents claimed to use benzodiazepines to *'get to sleep'* (n=330, 55.5%): for long haul flights, overnight train journeys, long coach journeys and if their sleep pattern needed correcting.

To assist in sleep, it was noted the majority of Valium users consumed around 5 - 10 mg. Although the dosage was not defined in the question, it was assumed users were referring to the blue 10 mg tablets. A third of those using Valium to get to sleep took 2 pills (n=108, 32.7%) and a quarter took 1 (n=83, 25.2%). Others took 3 (n=39, 11.8%), 4 (n=18, 5.5%), 5 (n=16, 4.8%), 6-10 (n=10, 3%) or over 10 (n=9, 2.7%).

Those who used Xanax often used approximately 0.5 mg – 2 mg. Over a third claimed to take 1 Xanax bar to get to sleep (n=125, 37.9%) and a quarter usually take 2 (n=78, 23.6%). Others take ½ (n=8, 2.4%), 3 (n=26, 7.9%), 4 (n=9, 2.7%) or 5 (n=5, 1.5%).

> *'0.25 to 1 mg of Xanax to get to sleep. Low dose if I'm at home, high dose if I'm on something like a noisy coach'*

(Male, student, West Midlands, aged 18 – 21)

As discovered in previous studies (see Rigg and Ibañez, 2010; Andersson and Kjellgren, 2017), some participants in the current study spoke of snorting their benzodiazepines which had an increased effect.

> *'Snorted some Valium on a coach and passed out in the foot well for the whole thing (the journey was about 20 hours long)'*

(Male, self-employed, London, aged 22 – 25)

There were also reports of them being used in a poly-drug use context in order to get to sleep after heavy stimulant or psychedelic drug use; however, this will be explored in section 4.5.5.

4.5.2 Self-medicate anxiety

A third (n=195, 32.8%) of respondents claimed to take benzodiazepines for their anxiolytic properties and some did so to cope with *'emotional distress'.* Many praised the exhilarating anti-anxiety effects, felt calm '*and on top of the world'* (Female, student, North West, aged 22 – 25).

For treating anxiety issues or stress, common doses for Valium users were 1 x 5 mg or 1 x 10 mg. Over a third of respondents took 2 Valium when self-medicating (n=69, 35.4%) and a fifth took 1 (n=37, 19%). Others take 3 (n=24, 12.3%), 4 (n=12, 6.2%), 5 (n=10, 5.1%), 6-10 (n=7, 3.6%) or over 10 (n=9, 4.6%). For Xanax users it ranged from 0.25 mg to 1 mg. A third of self-medicating respondents took 1 Xanax on each occasion (n=68, 34.9%) and a quarter took 2 (n=51, 26.2%). Others took ½ (n=3, 1.5%), 3 (n=16, 8.2%), 4 (n=8, 4.1%) or 5 (n=5, 2.6%).

There was no significant difference in using benzodiazepines to self-medicate for anxiety and related issues in males (n=106, 32.5% of all males) and females (n=89, 33.8% of all females). However, there was a significant difference between self-medicating participants and age: it was less of a motivation amongst 18 – 21 year olds (n=128, 30.3% of all 18 – 21 year olds), but more amongst 22 – 25 year olds (n=47, 37% of all 22 – 25 year olds) and those aged 26 and over (n=20, 43.5% of all aged 26+).

> *'[Xanax is] very rapid acting and amazing for anxiety'*

(Male, unable to work, North East, aged 26 – 30)

> *'I had severe anxiety and could barely leave the house … when I was first prescribed [Valium] I went out on a bike ride and the freedom of being able to go outside was exhilarating'*

(Male, student, North West, aged 26 – 30)

> *'[Valium] allows for conversation without unnecessary anxiety'*

(Male, student, Yorkshire and the Humber, aged 18 – 21)

> *'[Valium] has a subtle calming effect without being overly sedative and can adequately reduce my anxiety or help me get to sleep if needed'*

(Female, student, Ireland, aged 18 – 21)

'[I] took a Xanax and all my problems disappeared'

(Male, student, South East, aged 18 – 21)

'[Valium] gives a nice noticeable yet subtle high, almost like feeling drunk and makes everything a little easier and enjoyable to get [through]'

(Male, student, North West, aged 18 – 21)

A handful spoke about taking benzodiazepines to ease nervousness before flying, public speaking or *'performing in high pressure situations*' like job interviews and exams.

'If I have a speech or other presentation[s] I take a quarter bar of Xanax to help words flow more freely'

(Male, student, South East, aged 18 – 21)

'I take them constantly around assignment deadlines and exams. They take the edge off and help me focus'

(Male, student, North West, aged 26 – 30)

'I used to take 2 x 10 mg Pyrazolam or 1 x 10 mg Diazepam every single morning before work because I had to go out and approach people and talk to them. I felt I couldn't perform as well or sometimes go to work at all if I didn't take my benzos. I would call in sick if I didn't have access to benzos even though I wasn't ill, I just felt I couldn't go out and speak to people. I was aware of my addiction but I was performing great at work and delivering top results, whilst having fun and not worrying about anything. I felt care free, super confident and funny, chilled but motivated, very happy'

(Male, student, North West, aged 22 – 25)

A few male participants said they preferred to self-medicate as opposed to disclosing their mental health issues to a doctor. Similar to information discovered in the investigative piece by *VICE*, (see Chapter Two: section 2.6.3.1), a handful of participants blamed the lack of mental health services and the weak efficacy of traditional treatment methods as a reason for self-medicating, and stated that benzodiazepines are the most efficient way to relieve symptoms of anxiety:

> *'I have tried the NHS route of bullshit antidepressants, tricyclics, tetracyclics, beta blockers and the list goes on. Whilst z-drugs like zopiclone are effective for insomnia, they do nothing for my anxiety so I decide to self-medicate with the top contender of sampled chemicals (trialled various alternatives for roughly 5 years now)'*

(Male, self-employed, South West, aged 22 – 25)

> *'I… suffer from anxiety, and I find [Xanax] more beneficial than prescription medication I get prescribed'*

(Female, employed, South West, aged 18 – 21)

One participant, a former benzodiazepine addict, said the waiting list for psychotherapy treatment in her area is 14 months.

A handful of participants said they were initially prescribed benzodiazepines which started their habit and often sparked addiction. The majority began with prescribed Diazepam before moving onto others obtained from the illicit market.

> *'I started with Diazepam as [it] was prescribed by a doctor at first but they would only give me small dose that didn't affect me. So I ordered a larger dose of Diazepam online, would take 10 mg a night to sleep. Then I switched to Xanax because I read online that it is faster acting on the body and also doesn't last as long as Diazepam, meaning I could wake up fresh and not feeling drowsy from the benzo still'*

(Female, student, Scotland, aged 22 – 25)

> *'I chose to get benzos from dealers after finding it extremely difficult to top up my prescriptions through the NHS despite having been prescribed them previously back home (abroad) since [aged] 15 to 18'*

(Female, student, Yorkshire and the Humber, aged 18 – 21)

Although many participants spoke casually of relieving symptoms of anxiety, some individuals reported using them in more serious situations and at a significantly increased dosage. A handful spoke of suffering from severe anxiety, depression and attempted suicide.

> *'If I'm quite down or unhappy I just absolutely abuse drugs for a few weeks until my body can't take anymore. Then I recover, and get a new job or something. I've recently got a job so I'm fine right now'*

(Male, employed, North West, aged 22 – 25)

> *'I was very depressed and took 9 of my 2 mg Valium's to make myself feel better'*

(Female, employed, South West, aged 22 – 25)

> *'I was walking to [university] when I was at a very low point in my life illness wise and I began hitting myself in the head in public to help relieve the immense tension I felt from my PTSD. I got embarrassed that people were looking and watching me, and I didn't want to take my medication for a small episode as it was hard for me to get from the NHS, but the self-harming got worse. I took a Valium and it blanked out the noise in my head, cooled me down, and accompanied with doodling I was able to recollect myself in uni. Even the ache from the self-harm was numbed a bit'*

(Female, student, Yorkshire and the Humber, aged 18 – 21)

> *'[Suicidal] overdose 6 x 10 mg Diazepam'*

(Female, student, North West, aged 22 – 25)

> *'Taken 90 tablets of Valium once to commit suicide. Passed out ended up in hospital'*

(Female, student, Scotland, aged 22 – 25)

> *'One of my friends was self-medicating on Valium because he had cancer and was taking about 10 a day and is still taking them in hospital alongside his meds'*

(Female, student, North East, aged 18 – 21)

'I once tried to commit suicide by taking about 20 Valium at Exeter train station, because my OCD had developed a theme where it was obsessively telling me I was causing terrible harm to others, and giving me compulsive urges to kill myself to 'prevent' this harm. I was delusional with very severe OCD and had no true desire to die'

(Female, student, South West, aged 26 – 30)

4.5.3 To relax

A theme which emerged from textual analysis was that participants often used benzodiazepines *'to relax'* and '*to get waved*'. Many people seek relief and relaxation after a long day of work or studying by indulging in a glass of wine or pint of beer, as one interview participant described:

'…there is definitely some escapism by taking them. If I've been working flat out for a week, it's the same as getting drunk really. You know when you've had a tough week and just want to get wankered?'

(Male, employed, North West, aged 22 – 25)

However, the current study proved that individuals sometimes take benzodiazepines for similar effects: to feel good, happy, *'light and floaty'.*

'It's nice to take Xanax just to have a relaxed evening sometimes, not necessarily to get high'

(Unknown gender, student, South West, aged 18 – 21)

'Had a couple Xanies after a tough week at work and just needed to unwind and forget it for a while'

(Male, employed, North West, aged 22 – 25)

'Took 2 Valium in summer and went for a bike ride and picnic with my friends … It made the day so much more relaxing and enjoyable'

(Female, student, North East, aged 18 – 21)

'I took 1 Xanax, smoked a blunt on my own in my room and danced on my own to music in an extremely free and natural way'

(Male, student, Yorkshire and the Humber, aged 18 – 21)

One person said they sometimes take ½ of a 2 mg Xanax bar before work *'to make it more fun'* (Male, student, South West, aged 22 – 25).

4.5.4 To get high/poly-drug use

Nearly two-thirds of respondents said they take benzodiazepines *'to get high'* (n=368, 61.8%). A handful gave in-depth, detailed experiences of memorable encounters involving benzodiazepines some of which can be found in appendix 43, however the general motivation for this group of users was to *'get messy'* and that they *'like the buzz of it'.* A small number of respondents stated feeling '*like a marshmallow'* whilst intoxicated.

Dosage generally doubled when users were using them in a recreational context, however it ranged from 5 mg – 100 mg (Valium) and 0.5 mg – 20 mg (Xanax). A third of respondents took 1 Valium to get high (n=107, 29.1%). Others took 2 (n=47, 12.8%), 3 (n=48, 13%), 4 (n=23, 6.3%), 5 (n=22, 6%), 6-10 (n=14, 3.8%) or over 10 (n=12, 3.3%). Two-fifths of Xanax users took 1 to get high (n=146, 39.7%) and a third took 2 (n=110, 29.9%). Others took ½ (n=15, 4.1%), 2 (n=34, 9.2%), 3 (n=34, 9.2%), 4 (n=16, 4.3%), 5 (n=9, 2.4%), or over 10 (n=1, 0.3%). Males were more inclined to get high using benzodiazepines and other substances than females (m=224, 68.7% of all males; f=140, 53.2% of all females).

> *'[I take] 5 - 10 x 10 mg Valium on a night out with alcohol, and likely with ketamine, cocaine, MDMA, speed, or a mixture. Same with 3 - 5 x 2 mg white Xanax bars'*

(Male, student, London, aged 18 – 21)

> *'I take at least around 7 [Valiums] in one occasion. It's just so easy because you take 1, and then think 'I can't feel a fucking thing' and then take 2 more and feel a little bit… But think 'fuck it I'll take some more' and take another 3 and then your heads gone just like that, and suddenly you wake up and there's like 20 marks on your hand'*

(Male, employed, North West, aged 22 – 25)

> *'5 x 5 mg Valium really helps me melt like a marshmallow'*

(Male, student, West Midlands, aged 18 – 21)

The dominant mention of using benzodiazepines in conjunction with other drugs to heighten their effects was noted. Users spoke of poly-drug use, in particular, alcohol (n=395, 66.4%). A clear theme which emerged was that mixing the two heightened levels of intoxication quickly and cheaply. A third of users consumed ketamine alongside[4] benzodiazepines (n=198, 33.3%) and a quarter of participants used cannabis (n=80, 13.4%). Some spoke of *'fighting the sleep'* to get more high.

> *'When [Valium is] mixed with alcohol it gets you drunk faster and you just get a bit loose'*

(Female, student, Yorkshire and the Humber, aged 18 – 21)

> *'Weed is the cake Xanax is the icing. + weed is not strong enough to forget about some things…'*

(Male, student, North West, aged 22 – 25)

> *'Spent the night with friends in a flat, took MDMA, 2c-I, 2c-B and smoked hash. I remember a long, messy, weird, fun night. Gradually everybody peeled off and went to bed, and I took about 10 mg or 15 mg of Valium with whiskey to wind down, though I had no intention of sleeping. Intermingled with the MDMA: I felt just profoundly dreamy and relaxed, but also excited, the world seemed full of potential and I felt on the cusp of something exciting, the world seemed full of connections waiting to be discovered. Spent a few hours reading Wikipedia and listening to music, engrossed, got sleepy and went to bed'*

(Male, student, North West, aged 22 – 25)

For social situations, most dosages were reliant on what was available:

> *'It really depends on whatever someone has going'*

(Male, student, North West, aged 22 – 25)

> *'Often people give them out like sweets after a long night'*

(Male, student, North West, aged 18 – 21)

> *'After a night out depending on whether benzos have been ordered or how many are in the house massively depends on how many are consumed, it is very easy to get carried away and [sometimes] somewhat dangerous amounts are consumed'*

(Male, student, North West, aged 18 – 21)

It was evident that a lot of users were unaware of the dosages they were consuming:

> *'1 – 3 Valium after a night out or at a festival to chill out (medium dose, not sure exactly maybe 12.5 milligram?)'*

(Male, student, Yorkshire and the Humber, aged 18 – 21)

> *'Have no clue what mg they were bought off an unknown dealer at a festival, but I took 3 bars of Xanax after using MDMA'*

(Female, student, Yorkshire and the Humber, aged 18 – 21)

A key theme which emerged from this group was that users choose to drink with them feel more confident. Some users claimed to consume a Valium pill or Xanax bar *before* going out to meet friends.

> *'They're a lot of fun to drink with. They relax me and make me very adventurous'*

(Male, student, South West, aged 18 – 21)

> *'[Valium] makes me a bit more social on nights out'*

(Male, student, North West, aged 18 – 21)

> *'1 x 10 mg Diazepam before I go and socialise to calm my nerves'*

(Male, student, North West, aged 22 – 25)

However, the negative side effects when mixing other substances with benzodiazepines were noticed by some:

> *'[I was] chilling at a mates house. [I] took a Xanax then after some time had some MDMA. [It] created a [very nice] high but in terms of physical wellbeing felt very alert and slow at the same time, as expected. [I] was scared for my heart the day after'*

(Male, student, North East, aged 18 – 21)

'I took 2 Xanax and got very drunk and high (off weed). One of the weirdest experiences, I was constantly flipping between feeling to fucked and pretty much sober. I then proceeded to throw up all over the bottom floor of my mates house because benzos and alcohol are a very bad and dangerous mix'

(Male, student, South West, aged 18 – 21)

A high number of respondents were aware that mixing benzodiazepines with alcohol often lead to memory loss and black-outs which will be explored further in section 4.8.2. The concurrent use of multiple depressant drugs is a concern as explored in previous chapters (see Chapter Two: section 2.7.5). Harm reduction advice and recommendations will be discussed in Chapter Seven.

4.5.5 To counteract other drug effects

As discussed in previous chapters, benzodiazepines are sometimes needed to 'come down' off other drugs (Rigg and Ibañez, 2010; Kapil et al., 2014; Beharry and Gibbons, 2016; Mateu-Gelabert et al., 2017) especially after excessive cocaine use (Bardhi et al., 2007; Motto-Ochoa et al., 2017). Rising purity levels may be at fault for will be explored in Chapter Five: section 5.1.3.2. The most dominant motivation, inclusive of three-fifths of survey participants, was *'to counteract the effect of stimulants'* (n=369, 62%), after a rave, a house party, or at music festivals. A third of all respondents claimed they had used MDMA (n=208, 35%) and/or cocaine (n=189, 31.8%) alongside[15] using benzodiazepines, other poly-drug users reported the use of amphetamines (n=59, 9.9%), Modafinil and/or Ritalin (n=27, 4.5%). Most users in this category used the drug to '*end the night'*. Males were more inclined to use benzodiazepines to counteract stimulants than females (m=222, 68.1% of all males; f=144, 54.8% of all females).

Similar to those using benzodiazepines to get high, dosage generally doubled when users were using them to counteract other drug effects. Broadly, it ranged from 5 mg – 100 mg (Valium) and 0.5 mg – 20 mg (Xanax).

A third of Valium users claimed to take 2 when counteracting the effect of stimulant drugs (n=124, 33.6%) and a fifth take 1 (n=78, 21.1%). Others take 3 (n=44, 11.9%), 4 (n=20, 5.4%), 5 (n=19, 5.1%), 6-10 (n=13, 3.5%) or over 10 (n=9, 2.4%). Two-fifths of those using Xanax for the same reason take 1 (n=157, 42.5%) and a quarter take 2 (n=93, 25.2%). Others take ½ (n=10, 2.7%), 3 (n=28, 7.6%), 4 (n=15, 4.1%), 5 (n=5, 1.4%) or over 10 (n=1, 0.3%).

[15] The question stated: 'before/alongside/after taking benzos (within the hour)?'

'[I] only use [them] after going out and taking harder drugs. After a night out it can help chill you out and helps you have a good, long, deep sleep'

(Male, student, Yorkshire and the Humber, aged 18 – 21)

'0.5 mg of Xanax or a 10 mg Valium after a night on MDMA, partly recreationally and partly to kill any residual stimulant effects'

(Male, student, West Midlands, aged 18 – 21)

'0.5 to 1 mg of Xanax to induce sleep at tail end of stimulant run'

(Male, student, South West, aged 22 – 25)

Over ten percent of respondents used benzodiazepines alongside[3] hallucinogens (n=83, 13.9%). The majority of users in this category did so to completely get rid of any negative lingering hallucinogenic effects.

'10/20 mg Valium after a night out on stimulants/psychedelics. 1 or 2 mg Xanax for the same reason. As much as required, generally similar dose to kill an intense or uncomfortable trip on LSD or shrooms'

(Male, employed, South West, aged 18 – 21)

'I took 1 Valium during a bad acid trip, it completely calmed me down and turned a potentially traumatic experience into something very beautiful'

(Male, student, North West, aged 22 – 25)

'I took a [Xanax] after tripping at a festival when I couldn't sleep. I was seeing flashing images behind my eyelids; when the [Xanax] kicked in I felt tremendously relaxed. Possibly the best physical experience I have had in my life so far'

(Female, student, North West, aged 22 – 25)

Some participants reported needing benzodiazepines after using common study drugs: Modafinil and Ritalin.

> *'I use [Xanax] for sleep because it is effective and doesn't have a come off / come down effect. A quarter bar Xanax (0.5 mg) can send me to sleep when finishing a stimulant session, Modafinil or other. It can also send me straight to sleep when having bad insomnia periods. When my sleeping pattern needs corrected, [I take] a Xanax at midnight and then set an alarm at 9am and a lot of coffee can correct the pattern'*

(Male, student, Scotland, aged 18 – 21)

It was suggested that Xanax was preferred when seeking to counteract the effect of other drugs due to its speed of onset, potency and shorter-acting properties. Similar to findings from Rigg and Ibanez (2010), a handful of recreational users in the current study snorted their benzodiazepines in order to experience the effects quicker.

> *'Crushing it up and sniffing it at the end of a night is useful to wind down, especially if you've been doing other drugs that night'*

(Male, student, London, aged 22 – 25)

> *'I snorted a line of Xanax powder to get to sleep after doing coke all night and slept through the whole next day. I was asleep for 35 hours'*

(Female, student, South West, aged 18 – 21)

In most cases, participants claimed to use benzodiazepines *after* heavy stimulant or psychedelic substance use. However, some reported to use them in conjunction with other drugs:

> *'Most memorable experience involved taking one half of a bar of Xanax as a means to diminish any negative 'come-up' effects of three 100 – 125 mcg 1-P LSD tabs [the LSD analogue that was available on the greymarket for several years prior to the 'New Psychoactive Substances' bill] in conjunction with moderate amounts of cannabis. In this case, the benzos managed to allow for greater introspection than had previously been achieved in earlier psychedelic experiences'*

(Male, student, West Midlands, aged 22 – 25)

One person stated they used benzodiazepines in the first few weeks of beginning Sertraline treatment, and another used benzodiazepines to counteract the effects of another class of drugs:

> *'To counteract the anxiety side-effect of cannabis smoke'*

(Male, student, Yorkshire and the Humber, aged 18 – 21)

4.5.6 Avoid hangovers and comedowns

Benzodiazepines were also reported to be useful to eradicate the unwanted, sometimes intense psychological and physical emotions associated with hangovers and comedowns. Those who used benzodiazepines for this purpose sometimes took them at the end of the night, however some took them the following day.

> *'I took it for the first time with my friend after we had been using MDMA and coke. That horrible come down feeling of no longer being high, but not being able to sleep totally went away when I took Diazepam. I just floated up to bed like a Marshmallow! Bliss'*

(Female, employed, West Midlands, aged 41+)

> *'0.5 mg of Xanax to get rid of hangover shakes if I have something important I need to do/focus on'*

(Male, student, West Midlands, aged 18 – 21)

> *'Sometimes I take 1 x 5 mg of Diazepam after drinking alcohol heavily to reduce the likelihood of anxiety the next day due to the effect alcohol can have on my mental health at times. I often have high anxiety and low mood for two days following a heavy night of drinking. I took one Diazepam before I went to bed because the alcohol made me emotional and I was crying uncontrollably about a situation that was going on in my life at the time. Found that the Diazepam actually prevented me from having the emotional hangover that I usually have, which was a nice surprise'*

(Female, student, Northern Ireland, aged 18 – 21)

'Love them on a hangover, totally chill you out and you don't feel anxious, usually take them in halves unless it's after a heavy night to help me sleep I'll have a full one then, only take them in the comfort of my own home normally don't want to be too spaced out in public'

(Male, student, North West, aged 18 – 21)

Some used them to correct sleep patterns which were disrupted due to heavy substance use.

'Most likely 1 x 10 mg [of Valium] the following two days after [partying] to avoid sleep paralysis which I get from taking MDMA or large amounts of ketamine'

(Female, student, South West, aged 18 – 21)

4.5.7 Multifunctional usage

It was noted that motivations often merged together and/or overlapped. Some spoke of needing to take a benzodiazepine prior to a night-out of socialising in order to feel more confident and chatty which would then also heighten levels of intoxication.

'2 mg of Xanax if I'm feeling nervous before going out or if I want a cheap night out'

(Male, employed, West Midlands, aged 18 – 21)

Benzodiazepine-intoxicated users' spoke of enjoying their evening filled with other substances, before leaving the party and taking some more when relaxing with friends at home. At the end of the night, a few more are taken to induce a restful sleep.

'One 2 mg Xanax will do me good for any situation I need it in, like getting to sleep after a night out or just for jokes, would rarely go to 4 mg. With Valium I may take one 5 mg to take the edge off before going out then bang a few more towards the end of the night, maybe sniff a few at afters, I'll take however many I have on me cos they don't really knock you out like Xanax does which is a good thing'

(Male, student, South East, aged 18 – 21)

Benzodiazepines are then also needed to correct irregular sleep patterns for the few days after the drug-fuelled weekend.

'Depends, if it is a heavy week and I go multiple days in a row I will need to take Xans to put me to sleep after. Then I need Xans to get to bed for like two nights after that'

(Female, student, North West, aged 18 – 21)

A timeline highlighting the multi-functional use of benzodiazepines in a recreational context can be found in appendix 57.

4.6 Depressant substance replacement

As explored in section 4.5.4 of this chapter, many participants stated that benzodiazepines were used in conjunction with alcohol to get drunk more quickly and cheaply. This implies users are mixing the two and need less alcohol to feel intoxicated effects and thus replacing half their usual alcohol intake with a benzodiazepine. After highlighting the ease of access and low cost of benzodiazepines in section 4.4, this may explain the recent spike in use amongst children and young people (aged under 18) (see Chapter Two: section 2.4.1) as Xanax may be the cheapest, most accessible substance made available to them. This will be discussed further in Chapter Seven.

When respondents were asked why they prefer benzodiazepines to any other sedative substance like cannabis, four-fifths believe benzodiazepines have the best desired effect (n=350, 58.8%), over half say it is due to their cheap prices (n=317, 53.3%), two-fifths claim it is because they are easy to consume (n=261, 43.9%), and over a third say it's because they are the most accessible (n=228, 38.3%). Others said it is the only drug they had tried to get this effect (n=97, 16.3%) and that they are easy to hide (n=90, 15.1%). Some also said benzodiazepines seemed *'safer'* than other drugs, and were '*more socially accepted*'. Some individuals simply *'wanted to try it'.* A few respondents claimed that they could go out in public high on benzodiazepines and it would go unnoticed, as opposed to any other drug. Many preferred them as there would be fewer legal repercussions if they were caught in possession.

'They are easier to carry round and it's more socially acceptable to take in certain situations than smoking weed'

(Female, employed, North East, aged 22 – 25)

'Repercussions of being caught with them is much less and [it is] easier to talk your way out of when compared to illegal drugs like weed'

(Male, student, Yorkshire and the Humber, aged 18 – 21)

'[I] much prefer taking a pill rather than smoking a joint'

(Male, student, North West, aged 18 – 21)

Some respondents said they much preferred benzodiazepines than smoking cannabis to relax or get high, as the latter *caused* anxiety, paranoia, hangovers and *'pranging out'*.

'Different weed strains have different effects, some make my anxiety worse. Xanax is a consistent feeling'

(Male, student, London, aged 18 – 21)

'It is the only available class of drugs that truly sedate your mind as well as body. Eliminates any anxiousness often felt during comedowns. Weed is relaxing but often can be quite introspective which isn't always wanted'

(Male, employed, North West, aged 18 – 21)

However, some respondents do not see benzodiazepines as a direct replacement. If cannabis was not easily acquirable, benzodiazepines were simply viewed as *'the next best option'*.

4.7 Benzodiazepine preference

Preference of benzodiazepine was almost split equally between Valium (n=276, 46.4%) and Xanax (n=265, 44.5%). However, it was noted that out of all the respective gender group, significantly more females preferred Valium (f=50.6%, m=42.6%) and more males preferred the more potent benzodiazepine, Xanax (f=41.4%, m=47.2%). Key themes for both categories were: cost and value for money; availability and ease of access; strength; risk factor and; positive anxiolytic and tranquilising effects. When justifying their preferences, participants often compared the two and many contradicted each other. Having established Valium and Xanax as the dominant benzodiazepines used by this UK sample, the following section illustrates the key reasons why these two brand names are the most popular.

A cross tabulation of participant age and benzodiazepine preference revealed that Xanax is the most popular amongst those aged 18 – 21 (n=202, 47.9% of all 18 – 21 year olds) compared to Valium (n=187, 44.2% of all 18 – 21 year olds). However, older participants preferred Valium. Over half of all 22 – 25 year olds preferred Valium (n=67, 52.8%) compared to Xanax (n=47, 37%).

4.7.1 Valium (Diazepam)

The predominant themes for those preferring Valium than any other benzodiazepine was the ease of access and low cost.

> *'[Valium is the] ideal strength for me personally and they tend to be cheap to acquire'*

(Male, student, South West, aged 22 – 25)

Valium was perceived to be a lot safer and had lower risk than other benzodiazepines as they are legitimately prescribed in the UK, and users believed the source would be via diverted prescription. Its legal status also swayed people to taking them as opposed to any other drug: repercussions of getting caught in possession would be much more relaxed, and individuals felt they could freely have Valium on their person in public and through airport customs.

> *'[Valium is] cheap and easy [to] go get real ones that are from a pharmacy and not pressed by someone else'*

(Male, student, East Midlands, aged 22 – 25)

> *'[Valium] doesn't feel as 'drug-like' as the others'*

(Male, student, North West, aged 22 – 25)

Described as *'the least sinister of the BZDs'* (male, North West, student, aged 18 – 21), Valium's weaker potency meant users could easily and sensibly control the dosage, and take more if needed. There were also many accounts praising the efficacy of Valium, and the limited side effects (as opposed to other benzodiazepines).

> *'[Valium] doesn't taste funny or knock you out. It produces a warm pleasurable feeling'*

(Male, student, North West, aged 22 – 25)

> *'[Valium] doesn't put you straight to sleep, it just makes you really chilled and care free'*

(Male, student, North West, aged 22 – 25)

> *'[Valium is] long lasting and has a lower potential of abuse'*

(Male, student, London, aged 18 – 21)

'Not as high dosage so you still get the anxiety relief and slight euphoria while still being able to function and remember everything'

(Female, student, London, aged 18 – 21)

'Valium [is a] lower strength and [I] have found it has a shorter effect allowing you to do things more easily in the morning'

(Male, student, South West, aged 18 – 21)

Those who have tried both Valium and Xanax were quick to compare the two. Xanax was frequently described as *'intense'*, *'hectic'* and '*too much',* thus, many preferred Valium. Participants spoke of the negative effects of Xanax such as headaches, grogginess, total memory loss and black-outs which were amplified with the addition of alcohol. Alongside being put off the possibility of counterfeits, a handful of individuals also disliked the feeling the day after taking Xanax. Hangover effects were described as feeling *'like a zombie'* and '*spaced out'* the next day. Adverse negative effects will be explored more in-depth in the section 4.8.

'Valium has better recreational ability. Xanax just knocks you out with little memory or enjoyment. Valium is more of a slow progression into hilarity which can be remembered more easily. Basically, Valium is more fun'

(Male, student, East of England, aged 22 – 25)

'Alprazolam is too strong and should not be taken recreationally... [I] always wake up with a cracking headache. Valium is the perfect blend in my opinion. I feel at ease and free to enjoy myself'

(Male, student, South West, aged 22 – 25)

4.7.2 Xanax (Alprazolam)

The predominant theme in the Xanax category was that it is *'the most popular'* amongst peers and thus *'easily available'*. Many said they simply do not know of anyone selling any others and that they only know people with Xanax. Of the 184 qualitative answers, over a third (n=66, 35.9%) expressed comments such as:

> *'It's the one all of my friends take'*

(Female, student, London, aged 18 – 21)

> *'[Xanax is] cheap and easy to get. [It's a] guaranteed product from my supplier. [I] don't know of anyone selling the others. Xanax has definitely surpassed Valium use in student circles'*

(Male, student, North West, aged 18 – 21)

> *'It's a popular drug with young students and easiest to get hold of from dealers'*

(Female, student, Yorkshire and the Humber, aged 18 – 21)

As explored in Chapter Two: section 2.4.2, it is believed celebrity culture and adopted norms may account for the recent spike in non-prescribed benzodiazepine use:

> *'[Xanax] acts faster on the body, getting me to sleep really quickly after a day on Ritalin. Much stronger and fairly cheap. Plus all the celebs crack on with it'*

(Female, student, Scotland, aged 22 – 25)

However, one participant thought otherwise:

> *'SoundCloud rappers have ruined Xanax'*

(Male, student, North West, aged 18 – 21)

On the contrary to those who disliked Xanax due to its high potency, a lot of respondents in the second category saw this as a positive and preferred Xanax as it is *'better value for money'.* A handful of respondents are impressed by Xanax's fast onset of action and its short-acting properties.

> *'[Xanax] doesn't last as long and is stronger than Vallies'*

(Male, student, North West, aged 18 – 21)

> *'I find [Xanax] faster-acting and better for inducing a restful state (compared to Diazepam). I've also found it has less of a knock-on effect the next day due to its much shorter half-life'*

(Male, employed, South East, aged 31-40)

One user simply liked *'the shape of them'* (male, self-employed, North West, aged 41+) and some thought the bars were easy to split. Similar to Valium lovers who disliked Xanax, those who preferred Xanax also had negative perceptions of Valium.

> *'[Xanax is] best for getting rid of anxiety. Valium doesn't even touch the side'*

(Female, student, North West, aged 18 – 21)

> *'[Xanax] is stronger than Valium. Valium doesn't always have strong enough effects for me to enjoy as much as I might a Xan'*

(Male, student, South West, aged 22 – 25)

> *'[Xanax] makes me feel more wasted than Valium which is why I take them'*

(Female, employed, South West, aged 18 – 21)

4.7.3 Contradictory points

It was noted that participants had many varied viewpoints, which often contradicted one another.

Some spoke negatively of Xanax's potent knockout effects, however many saw this as a positive as they were better value for money. Compared to Valium, the majority of respondents thought Xanax was more dangerous due to its high potency and the possibility of encountering counterfeits. However, some spoke of street dealers and online vendors who produced *'reliable'* and *'quality'* Xanax, and others thought it was the safest due to its shorter elimination half-life.

'[Xanax] kicks in quick, doesn't have as much of a hangover as other benzodiazepines and most reliable to obtain in terms of quality'

(Male, student, London, aged 18 – 21)

'[Xanax has a] shorter half-life, less risk of dying because of dubious dosages'

(Male, employed, North West, aged 31-40)

'Xanax makes me feel very tired the next day and makes me want to fall asleep as soon as it hits, whereas Diazepam doesn't. Diazepam also lasts a lot longer and makes you less prone to blackouts than Xanax when taken in higher doses or mixed with alcohol'

(Male, student, North West, aged 18 – 21)

A key stated preference was that Valium users felt less hungover or groggy the morning after use, however a handful of respondents spoke negatively of Valium's long half-life which '*ruined*' the following day due to tiredness. Some users on the other hand claimed to feel anti-anxiety '*after-glow'* effects up to two days after use and spoke of no negative effects.

As previously stated, many claimed Xanax was '*too much'*, and the powerful knockout effects made it impossible to enjoy the drug without falling asleep soon after taking it. Other participants however thought Xanax was '*more subtle'* and some believed Valium was too sedative.

'[Xanax] doesn't leave me feeling tired the next morning like Valium does'

(Female, student, Yorkshire and the Humber, aged 18 – 21)

'[Xanax is] shorter acting than Valium, and is less noticeable and more subtle'

(Male, student, West Midlands, aged 18 – 21)

'Valium knocks you out whilst Xanax gives you a buzz too'

(Female, student, South West, aged 18 – 21)

'Don't get sleepy like you do with Valium or the others and you get a better high [with Xanax]. With Valium you have to take more to reach a similar sort of high'

(Male, student, North West, aged 18 – 21)

4.8 Adverse negative effects

Counter to participants justifying their motivations for the non-prescribed use of benzodiazepines, individuals also reported a wide range of negative effects. By loosely following the layout of Chapter Two: section 2.7, participants in the current study spoke of temporary sedation impairing psychomotor tasks and feeling hungover after use (section 4.8.1); black-outs and total memory loss (section 4.8.2); the feeling of invincibility and causing havoc (section 4.8.3); accidents and injuries (section 4.8.4); emotional blunting and depression (section 4.8.5); tolerance, dependency and withdrawal (section 4.8.6) and; mortality (section 4.8.7).

4.8.1 Temporary sedation, complex psychomotor tasks, 'hangover' effects

A few respondents spoke of unwanted side effects such as headaches and slurred speech, especially after consuming Xanax and many claimed to feel *'spaced out'* or *'sluggish'* the day after use. Many felt drowsy and struggled to walk the next day. Similar to previous studies which highlighted the link between benzodiazepine use and fractured cognitive abilities (see Chapter Two: section 2.7.2), many users felt they could not fully concentrate the day after use.

> *'Xanax leaves you feeling so spaced out the following day'*

(Male, student, South West, aged 22 – 25)

> *'[My] brain felt like it was on fire two days after [use]'*

(Male, employed, unknown home region, aged 31 – 40)

Similar to the Dutch driving study where six participants fell asleep at the wheel 1 hour after orally ingesting 1 mg of Xanax (Verster et al., 2002), one respondent from the current study felt the effects of the drug whilst driving even the day after:

> *'I took some Xanax in powder form after having a few lines of coke one night in order to get to bed around 12. My friend must have given me too much … I fell asleep in my driving lesson the next morning. Needless to say, my instructor never contacted me for another lesson'*

(Male, student, South East, aged 22 – 25)

> *'Crashed my car after stupidly driving after taking around 5 x 10 mg Diazepam'*

(Male, employed, North West, aged 22 – 25)

One respondent reported being spiked:

> *'Was in a Casino in [London] on my usual stimulant cocktail with a female friend; a gay guy in his 50's spiked our drinks and thankfully because of my tolerance when I realised I was coming down way too early and my friend was unsteady I quickly realised the case and handled the situation'*

(Male, unable to work, East of England, aged 22 – 25)

4.8.2 Black-outs and memory loss

> *'Memories are quite a blur with Xanax'*

(Male, student, South West, aged 18 – 21)

Although it has been acknowledged for many years that benzodiazepines are powerful hypnotics and are extremely useful for insomniacs (Kerr and Ong, 1995; Carter et al., 2010; Lader, 2011), their powerful knockout effects overwhelmed some. Individuals were often taken aback at how quickly they fell asleep, some within 5 minutes, and how nothing could awake them. Individuals claimed to have slept for extremely long periods of time (sometimes 2 or 3 whole days) and the effects lingered for up to a week after use.

> *'I took 1 at a uni house party and ended up falling asleep face first on the floor. The party carried on while I slept and woke up in the morning with a banging headache and no dignity left'*

(Male, employed, North West, aged 22 – 25)

> *'I got really drunk and thought it would be funny to take a Xanax, fell asleep after 10 minutes of taking it and passed out for 2 days. After I arose from my very long sleep I felt anxious and wasn't properly recovered until another 3 days'*

(Female, student, East Midlands, aged 18 – 21)

> *'One time I consumed 15 in one night and had a black out for 3 days being [lethargic] and low energy for about 5 days. This is [something] I regret and would never do again'*

(Male, student, North West, aged 18 – 21)

A key theme and negative side effect of benzodiazepine use was that users would fail to remember the night on them, which deterred a lot of individuals from using them altogether. Memory-wiping effects mainly happened when Xanax was consumed with other substances, in particular alcohol. Some claimed that the memory wiping effects persisted for up to 3 days after consumption.

> *'Took a Xanax to counteract the effects of cocaine, thought I'd gone to sleep after but turns out I had a whole night out which I cannot remember at all. I was only aware due to the state of my bank balance and multiple people messaging me to ask if I was okay as they'd seen me out, and I obviously seemed very fucked'*

(Female, student, Yorkshire and the Humber, aged 18 – 21)

> *'Took a 2 mg Xanax pill before going out to dinner. Can't remember what we ate. Can't remember how we got home. My boyfriend had to prop me up and support me for some of the journey home apparently. Apparently I had my head on my boyfriend's shoulder and looked like the girl from the ring with my hair all my face. According to my boyfriend, people around us looked concerned'*

(Female, student, London, aged 18 – 21)

> *'I took 3 Xanax and drunk a couple of bottles of wine. Had no recollection of going out to a night club or anything afterwards. Yet photos and videos tell me I was partying for over 24hrs. Complete memory loss'*

(Male, student, South West, aged 18 – 21)

> *'I took a couple of Valium whilst drinking and was told the next day we visited a strip club. I was then told by my friend I got two lap dances for 50 pounds each or something. I don't even remember any of it. Feel really silly about that one'*

(Male, student, South East, aged 18 – 21)

> *'Can't remember a whole month due to taking so much Xanax, had to re-do a year of uni … [I] try to avoid them now, and [I] will try to sleep without even if been taking uppers. Don't use them to get high anymore'*

(Female, student, North West, aged 22 – 25)

Many reported losing things like excessive amounts of money, their house keys, passports and phones.

> *'Took 2 x 2 mg Xanax while out drinking and woke up with my bank account empty, a broken thumb and ripped jeans. No memory of events from about 30 minutes after taking first bar. Still had bank card in wallet so no idea what happened. Lied to bank and said it was stolen. Not used Xanax at all since this incident'*

(Male, employed, North West, aged 31-40)

> *'Bought loads for a night at motion for cheap ended up taking loads forgot everything lost phone and passport and this random girl took me home as she was really worried about me'*

(Male, student, East of England, aged 18 – 21)

> *'Took 6 Xanax went to the casino won £900 from £20 and gambled it all away within seconds and then got kicked out the casino for starting on the [manager]'*

(Male, student, East Midlands, aged 18 – 21)

Some accounts of total memory loss and black-outs were severely alarming regarding possible sexual exploitation and informed consent. Recommendations to reduce harm and dangers will be discussed in Chapter Seven.

> *'Took 1.5 bars of Xanax then [ketamine], both for the first time then woke up 15 hours later in someone else's bed in shorts I didn't have on the night before and minus £90 worth of good weed and 1g of MDMA. I never mixed Xanax with anything after that, a few drinks at most'*

(Male, student, Scotland, aged 18 – 21)

> *'Took 40 mg Diazepam after a night out. Remember taking them at my flat alone. Wake up to find myself at some girls house I had never seen before and was told I had had sex that night and slept over. Was very confused as no memory of the event'*

(Male, student, North West, aged 18 – 21)

A lot of users who took excessive amounts claimed they did not realise at the time of consumption.

> *'Had some hilarious moments out with mates, it got even funnier when the fake Xans and 6 mg Xans were going around and everyone had no recollection of what happened during the Xan binge'*

(Male, student, North West, aged 22 – 25)

> *'Took 12 Valium. We [used] a marker on our hand to keep track of how many [we'd] had, both my mates passed out. One of their girlfriends wanted to take them home so I drove him at 5am (his car). I can't drive, binned the car: lost a wheel and a wing mirror'*

(Male, employed, North West, aged 22 – 25)

> *'Took them when I was going to Los Angeles from Dublin in July 2017. I had written (forged) a prescription which was originally given to me. The GP gave me 50 [Valium] tablets that were 2 mg and refilled the prescription 5 times. I took 10 tablets when I arrived at the airport after having drank some vodka and beer. I took 5 more when at the departure lounge. When I went on the plane I drank some alcohol and took all the piriton tablets along with Nurofen Plus (codeine) and wine on the plane. I ''passed out'' until we landed and don't remember clearing immigration in L.A. I just remember arriving in my relatives house. When I arrived, I found that of the 400 tablets I had (8 bottles of 50 Diazepam tablets), I had completely finished 2 bottles leaving me with 300 tablets'*

(Male, unemployed, Ireland, aged 18 – 21)

> *'Taken too many … whilst drinking because I didn't feel the effects straight away, my sanity and control slowly deteriorated throughout this period and I woke up in a state and had no idea what had happened, got in trouble with friends, lost money etc. On both Xanax and Diazepam'*

(Female, student, North West, aged 18 – 21)

4.8.3 Paradoxical stimulation: feeling invincible and '*causing havoc*'

> *'You don't really have that many memorable ones on benzos! But I guess you go into full 'I don't give a fuck mode' if you get what I mean'*

(Male, student, London, aged 18 – 21)

> *'I feel like I can do anything on them'*

(Unknown gender, unemployed, Scotland, aged 18 – 21)

It was noted that benzodiazepines often made users feel '*invincible*' and that usage lead to irrational and erratic behaviour: Some reported shop-lifting, breaking into places, purposefully breaking things, driving and crashing their car whilst intoxicated, getting into fights, and/or physically attacking people. Many were kicked out of bars and clubs due to '*causing havoc*'. It was noted that these behaviours were only amongst poly-drug users and those who consumed excessive amounts of benzodiazepines.

> *'After Parklife, my friend took 8 [Valium] and ran through my friends door, to try and stay awake. Took it clean off its hinges'*

(Male, employed, North West, aged 22 – 25)

> *'Took 2 Valiums, had 4 cans of lager, acted like a c**t and kicked my best mate in the neck'*

(Male, student, North West, aged 18 – 21)

> *'I got drunk then took a Xanax to sleep and because I felt incredibly upset and anxious and woke up the night day having completely blacked out and beat up my housemate, breaking doors with a fire extinguisher and fell down the stairs causing me to get kicked out of my uni house'*

(Female, student, North West, aged 22 – 25)

4.8.4 Accidents and injuries

Another negative side effect which was closely linked to the feeling of invincibility was that users often injured themselves whilst intoxicated. Over the years, studies have shown that even small doses of Valium, Xanax or other benzodiazepines can significantly diminish motor skills and thus lead to more accidents and injuries (see Bond et al., 1983; Block and Berchou, 1984; Thomas, 1988; Kozená et al., 1995; Verster et al., 2002; Friedman, 2006; Smink et al., 2010; Dassanayake et al.,

2011; Ravera et al., 2011). Users in the current study often had no recollection of or control over certain events whilst intoxicated.

> *'I took [Xanax] after a night out when I took MDMA and I fell down the stairs, dislocated my elbow and don't remember any of it happening'*

(Female, employed, South West, aged 18 – 21)

> *'I fell off a roof on Xanax and didn't remember. Luckily I was unhurt but this goes to show the inherent danger. This was whilst drinking, with less than 1 bar of Xanax'*

(Male, employed, South East, aged 22 – 25)

4.8.5 Emotional blunting and depression

A small number of participants said that benzodiazepine drugs in fact sparked feelings of anxiety and/or depression. Again, these negative emotions were heightened with the addition of alcohol.

> *'Took 1 Valium to calm down, but it had the opposite effect, made me increasingly anxious and my head was too foggy to function and distract myself'*

(Female, employed, North East, aged 22 – 25)

> *'Valium makes me feel depressed and [I am] normally likely to have break down if mixing with booze'*

(Female, student, South West, aged 18 – 21)

4.8.6 Tolerance, dependency and withdrawal

Many users tried benzodiazepines *'out of curiosity'*, however were soon put off by their addictive properties.

> *'Tried out of curiosity, found to be by far the most addictive drug I've tried so I haven't touched it since and don't plan on doing any benzo again'*

(Male, student, East Midlands, aged 18 – 21)

'I lost about 2 weeks to Xanax in the period between exams finishing and getting results. They are [madly] addictive'

(Male, student, East of England, aged 18 – 21)

Similar to participants' in Rigg and Ibanez's study (2010), some individuals in the current study said they began to use them as a coping mechanism for stress, anxiety or insomnia, but then usage lead to addiction, and benzodiazepines become the problem.

'Had a really bad experience with Xanax over a period of 2 weeks at most. My mate was addicted, and she recommended I take them to help me sleep. Soon I was addicted, taking 4 a day at least. I was unrecognisable ... I was a zombie. I was aggressive. I ruined friendships. I have no memory of it which is the scariest part of it. When I came off it I was suicidal'

(Female, student, Scotland, aged 18 – 21)

'Have gotten caught by Alprazolam and had to attend an Emergency Department due to sudden stopping. Spent 7 days in a locked Hospital DETOX unit. Very scary but am free from that drug now'

(Male, employed, North West, aged 41+)

In a face-to-face interview, a female aged 31 – 40 also spoke of initially taking non-prescribed Etizolam for sleep issues and chronic anxiety, which then developed into a two year Xanax addiction.

P: Oh gosh, so it's hard to say with Etizolam because they're like little blue pills… I didn't actually even know they were benzos!

I: What did you think they were?

P: Sleeping tablets, which in my head just didn't connect… Yeah it's really weird, this is how naïve I think I was… Well or stupid would be another word [laughs]. But yeah so, I was having one or two [a day]… at night 'cos it was to get to sleep basically. I'd gone from kind of in a relationship to being on my own… Being really into partying and stuff but not ever using them really for after parties. It was more for like if I was not able to sleep 'cos I've had problems with insomnia as well for a long time'

After becoming physically dependent on them, she spoke of Etizolam becoming unavailable and thus using Xanax instead. Using them every evening just to assist with sleep, she continued to work long hours and socialise. She spoke of debilitating withdrawal symptoms like physical pain.

P: … I was still working like 60 hours a week-

I: What! How!?

P: I know. And I was going out pretty much every weekend as well. God knows how I didn't kill myself.

I: Was it the same reason when you were taking Xanax…. To get to sleep?

P: Yeah-

I: So it wasn't in the daytime at all?

P: No, no. You know what though – I remember one trip down to London with my boyfriend, we went out clubbing… Obviously you're staying up all night. Normally my body would be used to having a Xanax but obviously I'm not gonna have one before I go out clubbing. So I didn't have anything, I didn't have anything on me. Anyway, on the way down on the train down to London, my back was in absolute agony. But I didn't want my boyfriend to know so I kinda just pretended it wasn't happening. But I really remember that night because I remember thinking "What am I doing?! Going out… Having a nice time but not having a nice time because I'm in so much pain?!" So I kept on going. 2016 – I don't really remember much of 2016…

I: So what made you stop?

P: It's a bit of a grim story. So, I nearly died… I ended up in hospital. I don't really remember what happened. I think I had a breakdown or something… All I really remember is, me and my boyfriend split up and there was about 2 weeks where I was trying to work but I was in the house, and I don't think I even left the house. I didn't eat anything for about 10 days, and a couple of my friends were dead worried about me. They basically came round and marched me to the hospital, and when I walked in I don't remember anything from A and E. They said it was sleep deprivation – Ironically. So I think it was chronic sleep deprivation-

I: Oh so your body just kind of shut down.

P: Yeah it just shut down. When you're not sleeping properly for that long… Ironically I don't think they help you sleep. They send you to sleep, but the sleep that you get is just weird… It's not refreshing, it's tiring. It's like tiring sleep… And by that point I was obviously having them, but they weren't really sending me to sleep.

Similar to previous studies which have highlighted the dangers of abrupt discontinuation (see Hollister et al., 1961; Péterssun, 1994; Ashton, 2002), this particular interviewee believed halting her usage was the issue which resulted in her being hospitalised:

'One of the things that kind of made it all unravel was that I decided I was going to stop, and I just stopped. I threw everything away'

Withdrawal effects were noted by some participants, including physical and crippling pain, loss of appetite, psychotic tendencies and rebound anxiety:

'… One thing I remember happening really vividly is that I thought there were loads of flies in my house … You know like that horrible buzz-y sound, I was hearing that. My mind was just obviously going mad'

(Female, employed, Yorkshire and the Humber, aged 31 – 40)

'Xanax makes you do stupid things and more importantly I would go on a bender i.e. taking it [for] over a week and then have the worst anxiety when I stopped. Like would freak out/couldn't sleep/thought I was going to die and this was a reoccurring problem'

(Female, student, North West, aged 18 – 21)

4.8.7 Mortality

A handful of participants said they had lost friends to benzodiazepines. All were used in conjunction with other drugs, in particular alcohol.

'…One of my close friends died from [Xanax]. He was a clubber, and he was using them anyway and no one knew, so he had a problem with them. But basically he got really pissed and was just a mess, went home and had too many and just passed away in his sleep'

(Female, employed, Yorkshire and the Humber, aged 31 – 40)

'Mostly I know that a majority of people in the bar/entertainment/events world use Valium or Xanax heavily to sleep after work and after parties. Having now lost 3 friends to Valium sleep death after events or heavy weekends of work/party, in just 2 years, I'm glad of my own move away from reliance on them and am keen to see if there is any way to make people more aware of the dangers of long term abuse and the risks of literally disappearing in your sleep and leaving your loved ones wondering what the fuck happened'

(Male, employed, North West, aged 31 – 40)

Poly-drug use dangers were also highlighted as serious concerns in previous chapters (see Chapter Two: section 2.7.5). These will be re-addressed in Chapter Seven.

4.9 Summary of chapter and conclusion

To summarise, this chapter highlighted the predominant use of Xanax and Valium amongst students aged 18 – 25 in the UK, alongside examining the context in which they are being taken, rates of usage and dosages. It is clear that other, problematic poly-drug users remain a key benzodiazepine user population, however this sample was not represented in this research due to the methodology outlined in the previous chapter. The young user group (18 – 21 year olds) preferred Xanax more and those aged 22+ preferred Valium.

The various motivations included: self-medicating everyday sleep and/or anxiety issues; to sleep on long journeys; to feel more confident in social situations; to feel more confident in presentations and/or exams; to relax; to get high and heighten the effects of other drugs such as alcohol and/or cannabis; to counteract the effects of other drugs such as stimulants (MDMA, cocaine), psychedelics (acid, LSD) and/or study drugs (Modafinil/Ritalin); to avoid or dilute the negative emotional and physical side effects of hangovers and/or comedowns; to ease physical pain and; to correct irregular sleeping patterns. Ease of access, availability and low cost was acknowledged as a significant motive for some, especially when other substances were unavailable and the majority of participants reported to obtain their benzodiazepines' from a dealer, closely followed by through a friend. Many highlighted the weak efficacy of NHS treatment services as a reason for self-medicating.

Survey participants also reported a wide range of negative effects, such as temporary sedation impairing psychomotor tasks and feeling '*groggy*' after use, which impaired concentration levels. A dominant negative effect was undoubtedly black-outs and total memory loss. Many reported paradoxical stimulation and feeling '*invincible',* but this often lead to accidents and injuries. Some reported experiencing emotional blunting and depression or heightened anxiety. A handful were

aware of the addictive properties of benzodiazepines which hated their usage, and some spoke of losing friends to benzodiazepine-related deaths.

The implications of these findings will be discussed further in Chapter Seven, where future recommendations will be made to users in an attempt to reduce avoidable dangers and harms and to ensure safety. Data from this research paper will also seek to advise health care practitioners, academics, substance use charities and future policy makers in order to reduce the non-prescribed use of benzodiazepines amongst young people in the UK.

The following chapter will outline the research methodology for the chemical analysis of seized street samples in Greater Manchester.

Chapter Five: Chemical analysis methodology

5.1 Introduction and chapter overview

Content tests have previously revealed that street-bought drugs can contain either: a higher percentage of active ingredient than what it is sold as or; a lower amount of, or zero active ingredient and thus bulked out with other, perhaps more harmful substances or, harmless bulking agents like sugar (Coomber, 1997; Liang, 2006; Cole et al., 2010; Wood et al., 2011; Lucio do Lago et al, 2016). Both pose significant risks for the consumer as they may overdose or suffer from adverse drug interactions that are unknown and thus, untreatable (Blackstone et al., 2014).

The following chapter will begin by reviewing existing studies and media coverage in order to highlight the need for content analysis. It will begin by attempting to examine the scale of the illicit benzodiazepine market (section 5.1.2). It will then outline the issues with counterfeits, specifically: drugs laced with other, more harmful adulterants (section 5.1.3.1); those with a higher concentration of the active ingredient and thus, increased purity (section 5.1.3.2) and; those with less active ingredient (section 5.1.3.3). Section 5.1.4 will examine the evolution of substance testing in the UK and its significance. This chapter will then outline the methodology created to perform chemical analysis to determine the content and purity of 29 seized 'Valium' samples and 29 seized 'Xanax' samples from Greater Manchester. It will begin by stating the chemicals and reagents used (section 5.2). Section 5.3 will outline the presumptive test used and the results, followed by methods of NMR and the results (section 5.4). Section 5.5 will outline the GC-MS testing element. Specifically: the GC-MS settings used (section 5.5.1); the preparation of the eicosane stock solution (section 5.5.2); the preparation of the reference and calibration standards (section 5.5.3 and 5.5.4 respectively) and; the unknown sample preparations (section 5.5.5).

5.1.2 Scale of the illicit benzodiazepine market

As any illicit market, the scale of the sale and supply of non-prescribed benzodiazepine is difficult to measure. However, in the early months of 2018, The Guardian reported that a colossal 130 million benzodiazepines had penetrated the UK illicit drugs market since 2014 (see The Guardian, 2018a). Collected over four years which began in the same year of Kapil et al.'s study as mentioned in previous chapters, this data has attempted to shed light on the size of the illicit benzodiazepine market. However, this figure only represents the drugs which were seized and it can be assumed that the overall number is much higher.

Further evidence comes from an MHRA investigation which discovered that from the years 2013 – 2016, approximately £115 – 200 million worth of medicines including Diazepam had been diverted from the legal supply chain and entered the illicit trade (see MHRA, 2018a). In addition, a BBC investigation exploring the supply of Xanax and in January 2017 reported three separate seizures of Alprazolam equating to over 50 kg, which would have been able to produce approximately 25 million Xanax bars containing 2 mg of active Alprazolam (see BBC News, 2018c).

As stated at the beginning of this chapter, obtaining benzodiazepines via means other than legitimate sources raises the possibility of encountering counterfeits. The following section will highlight the variety of counterfeited drugs, and the implications of each.

5.1.3 Counterfeits

Although benzodiazepines are one of the most prevalent diverted drugs within the UK (see ACMD, 2016), illicit drug traders tend to custom press their narcotics and add other adulterants in order to increase the bulk of substances and/or to enhance or copy the effects (Coomber, 1997; Cole et al., 2011), with the intent to increase their profit margin and their clientele base (Tzvetkova et al., 2016).

It is not simple to detect and quantify the scale of counterfeits, but it can be assumed that UK street Xanax is illegitimate as they are unobtainable via NHS prescription. The following section will highlight the danger of counterfeited drugs, which can be either: laced with other, more harmful adulterants (section 5.1.3.1); contain an increased amount of the active ingredient (section 5.1.3.2) or; contain smaller amounts of the active ingredient (section 5.1.3.3).

5.1.3.1 Laced with other harmful adulterants

Recently, the UK media reported that Xanax bought via social media had been cut with Etizolam (BBC News, 2018f), boric acid, rat poison, floor polish, and pesticides (Daily Mail, 2018). In Scotland, reports showed counterfeited street ‘Diazepam’ to contain benzodiazepine analogues Diclazepam, Etizolam and Flubromazepam, and synthetic opioid U-47700 (Police Scotland, 2016). Another major cause for concern is the presence of fentanyl-laced Xanax in the US (see CBS News, 2016; Fox News, 2018), and the possibility of it penetrating the UK scene. Consuming adulterated benzodiazepines can cause death by adverse drug interactions (Jackson et al., 2011) and health care professionals are unequipped in dealing with the unknown side effects. In particular, opioid-laced Xanax bars are a huge cause for concern, as their central nervous system depressant properties are much more potent than benzodiazepines, and users may overdose.

5.1.3.2 Increase in purity

The second danger associated with counterfeit drugs is an increase in the concentration of active ingredient and thus, the potential of overdosing. The increase in purity can be seen in other drugs: an EMCDDA report revealed that just under two decades ago, the average ecstasy found in MDMA pills ranged from around 50 – 80 mg (Wood et al., 2011). However, more recent data reveals that pills nowadays contain twice the amount: approximately 125 mg, and some 'super pills' have reportedly contained 270 – 340 mg (EMCDDA, 2016b). In addition, the most recent EMCDDA European Drug Report (2018) reported the highest levels of cocaine purity in the last decade.

With regards to benzodiazepines, the UK media have reported extremely potent custom pressed benzodiazepines. A detailed BBC investigation reported the emergence of red Xanax bars mid-2016. The 'red devils' were thought to contain over 5 mg of active Alprazolam and could be bought from online vendors for as little as 35p per pill (see BBC, 2018c). As an already potent benzodiazepine at 2 mg, 5 mg Xanax bars are extremely dangerous and can cause even greater adverse negative effects (as discussed in Chapter Two: section 2.7).

5.1.3.3 Decrease in purity

On the other hand, much media coverage is thought to be exaggerated and does not accord with personal accounts from dealers and/or forensic evidence (Coomber, 1997). Instead, it is thought that substances are frequently cut with benign substances like sugars (ibid.). Variation in the quantities of active ingredients as well as bulking agents within substances poses further risks. Users may become accustomed to certain dosages based on personal tolerances and/or drug habits. However, these may be inappropriate for another batch which may contain a vastly greater quantity of the active ingredient or a different bulking agent for example.

5.1.4 Substance testing in the UK

The knowledge and perceived importance of unknown substance use has seemed to grow in recent years. UK drug charity *The Loop* introduced forensic drug testing at nightclubs in 2013 and at music festivals in the summer of 2014, and Multi Agency Safety Testing (MAST) from summer 2016 whereby party-goers are able to anonymously submit their unknown, illicit substances for quantitative and qualitative analysis. The Loop's *Twitter* reports showed that samples sold as MDMA crystal powder in London were actually found to contain N-ethylpentylone which causes paranoia, insomnia and temporary psychosis and in Bristol, some MDMA pills contained 3 x the common adult dose.

However, with a dominant focus on club drugs like MDMA and cocaine, *The Loop* misses out the user population who use drugs in other contexts: i.e. those taking Xanax at 5am after a rave to come down from stimulants (see Chapter Four: section 4.5.5). The content analysis of benzodiazepines remains relatively undiscovered and thus, the forensic testing element of this research project wishes to shed light on the true contents of street Valium and Xanax in the UK. Moreover, it is difficult to generalise chemical analysis results from *The Loop* as the substances tested are dominantly those handed in which may lead skew the results.

In the current study, a presumptive colour test namely *'M.M.C. International B.V – General Screening/ Multi Party Drugs Test'* was initially used to reveal the adequacy of home testing kits and to note any false positives. The methods and results will be displayed in sections 5.3.1 and 5.3.2 respectively. Then, the methods and results of the nuclear magnetic resonance (NMR) tests will be displayed in sections 5.4.1 and 5.4.2 respectively, which were used to assist in the confirmation of the structural characterisation of the unknown compounds. Section 5.5 of this chapter will describe the methodology used for GC-MS analysis. GC-MS was used for the identification of the chemical profile of the unknown samples. Over the years, there have been multiple published studies which have used GC-MS to identify the contents and purity of illicit, street bought substances (see Yegles et al., 1997; Yilmaz and Akba, 2010; Jalali et al, 2016; Lucio do Lago and Angnes, 2016).

5.2 Chemicals and reagents

All reagents including methanol, eicosane and the reference standards were of commercial quality (Sigma-Aldrich, Gillingham, UK) and used without further purification.

Reference materials and standards were obtained, under UK Home Office licence, by authorised personnel and in compliance with both the UK Misuse of Drugs Act (1971) and UK Misuse of Drugs Regulations (2001). The test samples used within this study were received during the period of September 2017 – May 2018. Test samples (street samples) were provided by Greater Manchester Police (GMP) personnel, in accordance with the legislation and under the approved Memorandum of Understanding operating between the Manchester Drug Analysis and Knowledge Exchange (MANDRAKE) and GMP. All controlled and restricted materials were stored, transferred, used and destroyed in compliance with the UK Misuse of Drugs Act (1971) and UK Misuse of Drugs Regulations (2001). The researcher was unable to access information regarding the precise location and event of each seized sample.

A total of 29 assumed 'Valium' samples and 29 assumed 'Xanax' samples were tested. All of the 'Valium' samples were in pill form. V1 was the anomaly (see appendix 44 for pictures) and weighed 118.2 mg. V2 – V29 were from the same batch (see appendix 45 for pictures) and weighed from 53.3 mg (V7) to 67.4 mg (V27). See appendix 46 for all the unknown 'Valium' samples' weight and description. The majority of the 'Xanax' samples were in tablet form (see appendix 47 for pictures) and weighed around 250 mg. However, some samples were in powder form and the weight of each sample ranged from 44 mg (sample X6) to 914.6 mg (sample X4). X26 was an anomaly, and was in the form of a blue pill labelled 'UPJOHN 90'[16] (see appendix 48 for pictures). See appendix 49 for all the unknown 'Xanax' samples' weight and description.

5.3 Presumptive tests

Presumptive tests are a fast way of enabling immediate action when dealing with unknown substances (United Nations, 1994). Specifically, colour tests are commonly used by the Police force to determine the presence of various drugs (Philp and Fu, 2017). As an easy, one-step procedure, the *'M.M.C. International B.V – General Screening/ Multi Party Drugs Test'* is a cheap and fast way of testing unknown substances. It is able to identify the following (as displayed on the packaging): methadone; barbiturates/ketamine; cocaine/crack; ephedrine; heroin/mescaline; (meth)amphetamines/PMA; methaqualone/methylphenidate; oxycodone and; XTA (MDMA). See appendix 50 for a photograph of the packaging. Although benzodiazepines are not listed, it was important to run this test to identify any other potential adulterants and present any false positives of controlled substances (United Nations, 1994). Thus, informing users of the reliability and validity of such tests.

The following section will display the method of the presumptive testing element (section 5.3.1) followed by the results (section 5.3.2).

5.3.1 Method

Where necessary, tablets were ground and homogenized before running the presumptive test. Of the unknown samples, seven were chosen at random to perform the presumptive tests (X1, X2, X3, X8, X11, X16, and X17) alongside one test including the reference standard. A heaped spatula of the sample was added to an ampoule and vigorously shaken before being left to sit for five minutes.

[16] Research suggests the manufacturer is *Pfizer* and manufactured outside the US – usually in South America or Mexico

5.3.2 Results

Any colour change was noted immediately after adding the sample to the ampoule, and after five minutes. Initially there was no change in all eight tests (X1, X2, X3, X8, X11, X16, and X17), inclusive of the Alprazolam reference standard (see appendix 52 for images). After five minutes, the only noticeable change was a slight murky off-white tinge that X16 had developed (see appendix 53 for images). The closest substance related to the produced colour (as stated on the box – see appendix 50) was methadone. As methadone is a controlled drug and the match was perceived as very unlikely, this result was disregarded. The presumptive tests in this study have shown the possibility of false positives and that they are not reliable when testing benzodiazepines.

The presumptive test revealed little change therefore GC-MS analysis was appropriate to determine the true contents in each sample.

5.4 Nuclear magnetic resonance (NMR)

Every compound has its own unique spectra and thus, NMR is frequently used for structural characterisation to help confirm what the specific compound is (see Huidobro et al, 2007). The following section will begin by outlining the sample preparation of 18 samples used for the NMR tests (section 5.4.1). Section 5.4.2 will then display the NMR results, which were necessary to confirm the structure of the unknown samples before GC-MS analysis.

5.4.1 Sample preparations

For the current study, including both reference standards, a handful of unknown samples (X1, X3, X4, X6, X9, X16, X17, X28 – X32, V1 – V6) were chosen to run Dimethyl Sulfoxide-d6 (DMSO) and acetonitrile-d3 in order to give extra confirmation of the chemical structure of each substance. For each reference sample, two NMR tests were performed. In each test, 10 mg of the reference powder was added to 600 µL either deuterated DMSO or acetonitrile. The amount of unknown substance powder added to the DMSO and/or acetonitrile ampoule was dependent on how much powder was left over. Measurements ranged from 10 mg – 20 mg.

Solubility was an issue at the required concentration. Thus, all samples were ultra-sonicated and filtered using 0.45 mm filters. Used ampoules and pipettes were discarded in the relevant glass deposit bin. The individual DMSO tests ran for approximately 3 minutes and the acetonitrile tests ran for approximately 30 minutes.

5.4.2 Results

DMSO only extracted what the tablet is made up of, not the active ingredient. Thus, the results listed in appendix 53 displayed cutting agents like lactose. Acetonitrile tests extracted the active ingredient. The spectra displayed on each test matched the active ingredient spectra however the low match scores are due to there being no current database. Thus, researchers are urged to create a database for these substances to enable quick testing in future research.

See below for a few examples and comparisons of the NMR spectra's.

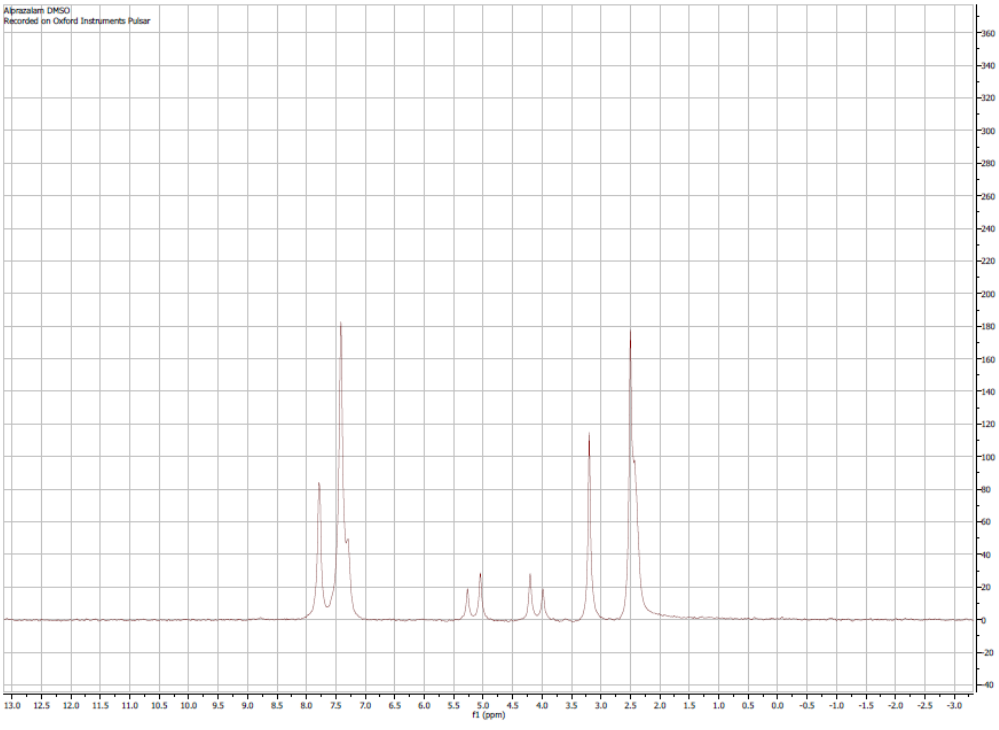


Figure 2: Alprazolam reference DMSO NMR spectra

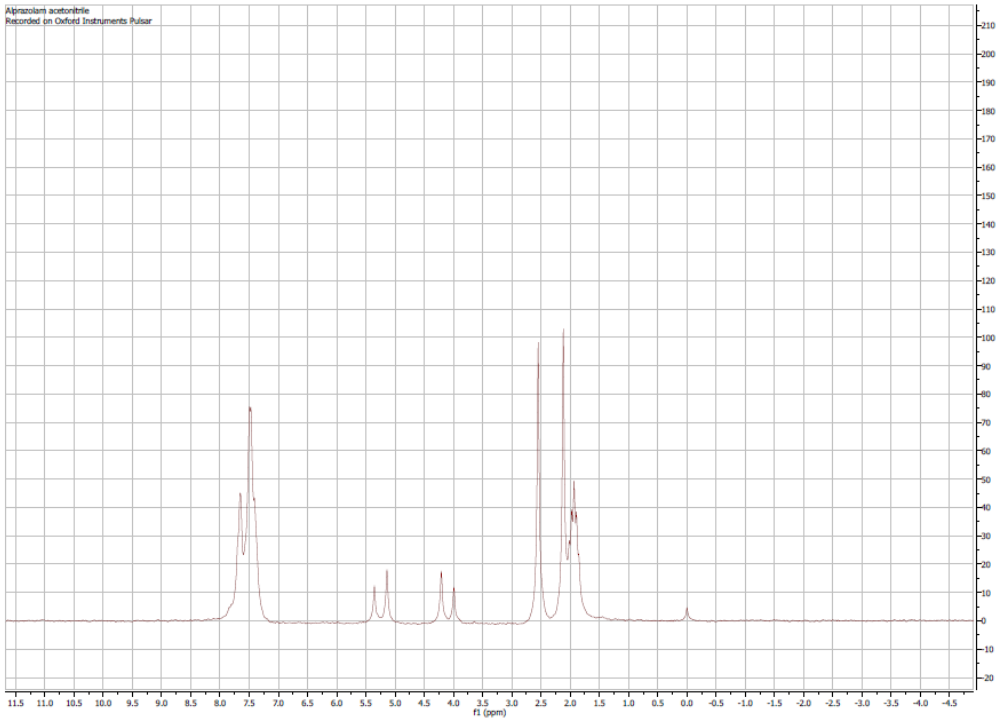


Figure 3: Alprazolam reference acetonitrile NMR spectra

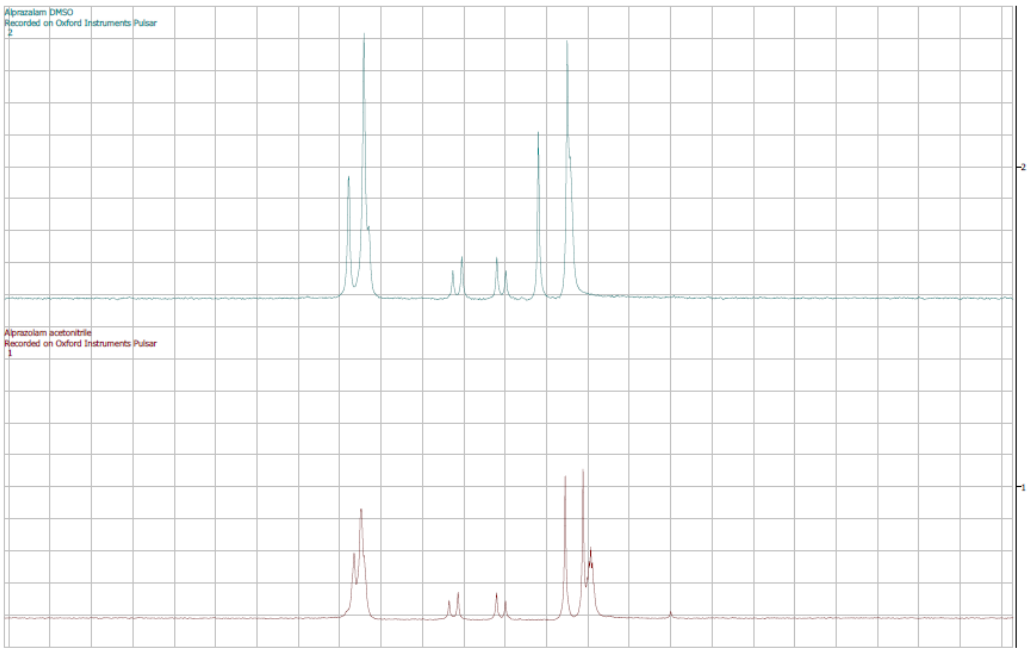


Figure 4: Alprazolam reference acetonitrile NMR spectra compared to the Alprazolam reference DMSO NMR spectra

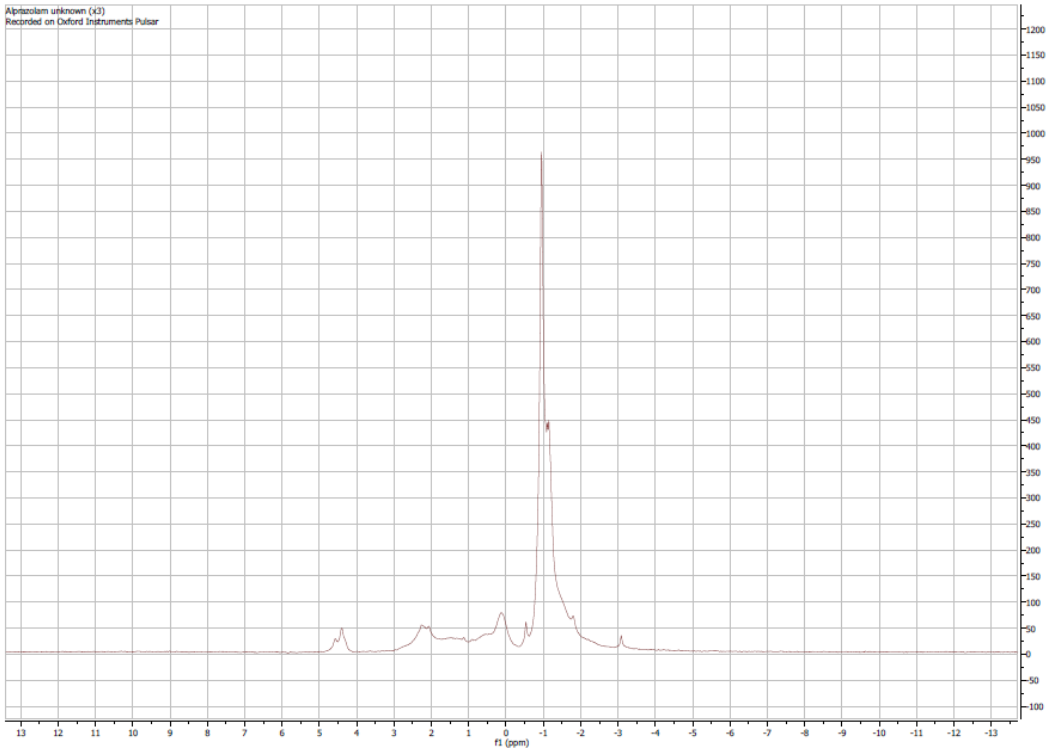


Figure 5: Sample X3 DMSO NMR spectra (Alprazolam)

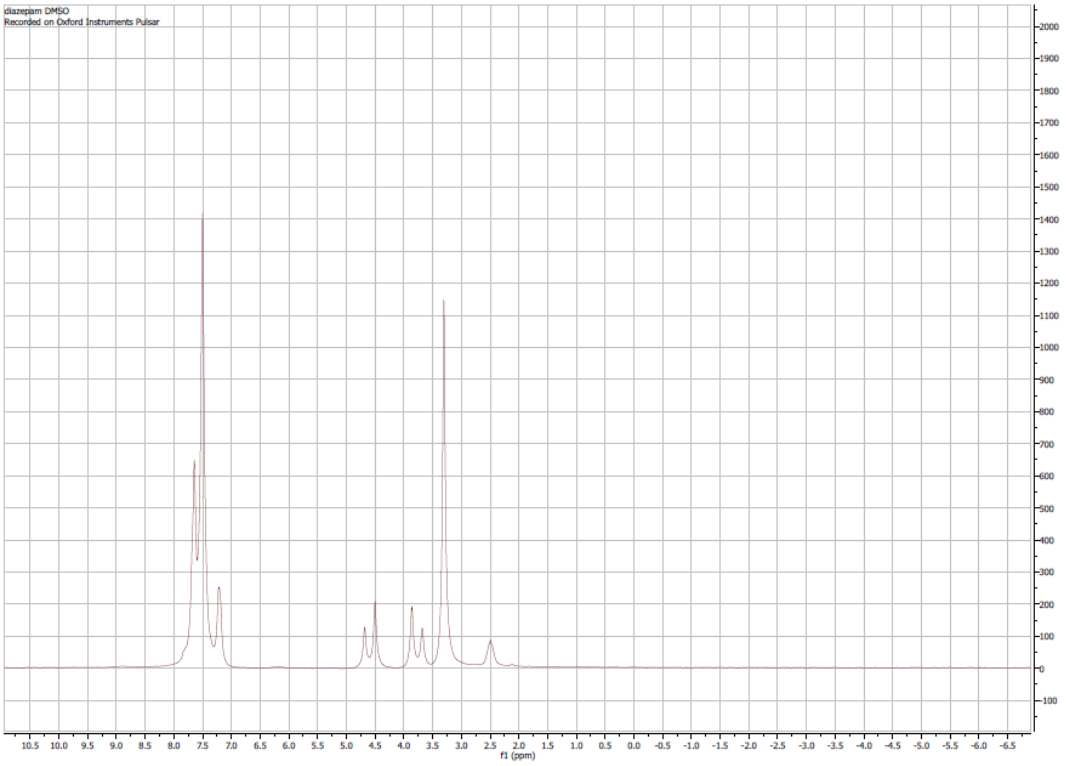


Figure 6: Diazepam reference DMSO NMR spectra

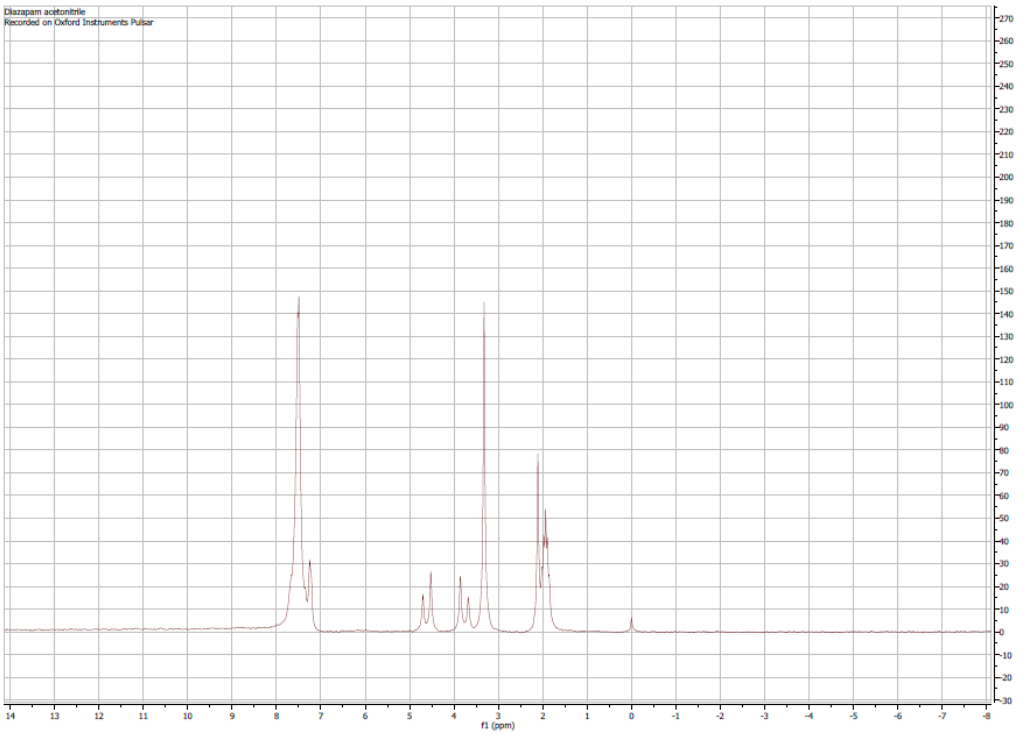


Figure 7: Diazepam reference acetonitrile NMR spectra

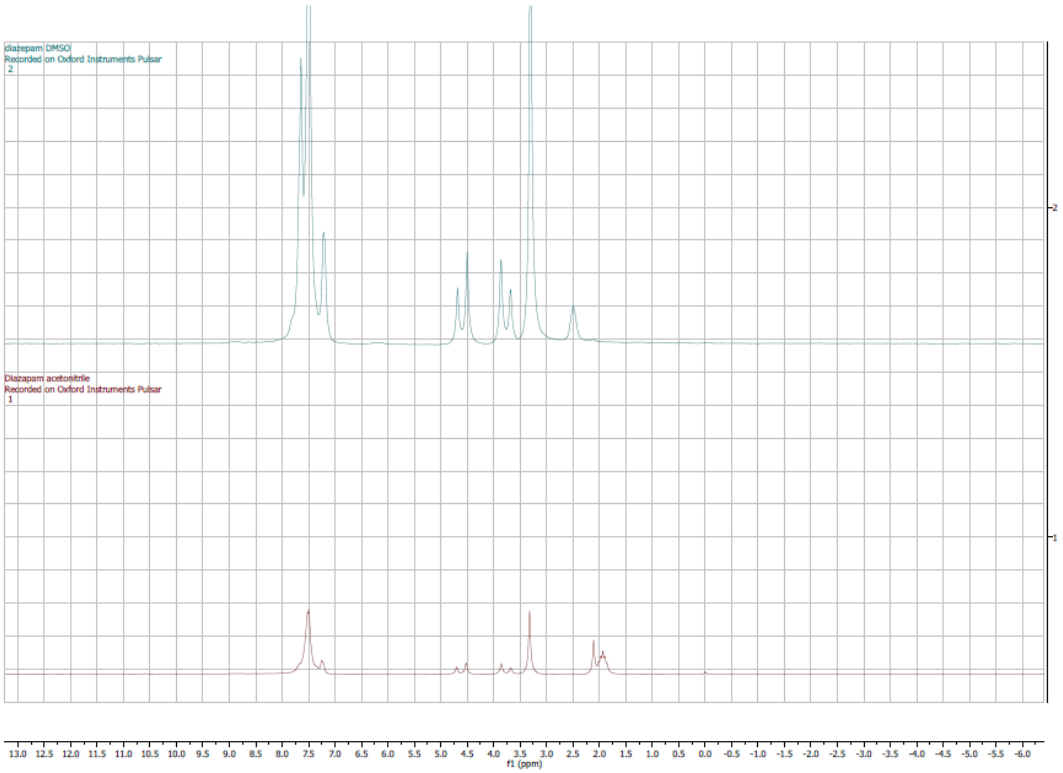


Figure 8: The Diazepam reference DMSO NMR spectra compared to the Diazepam reference acetonitrile NMR spectra

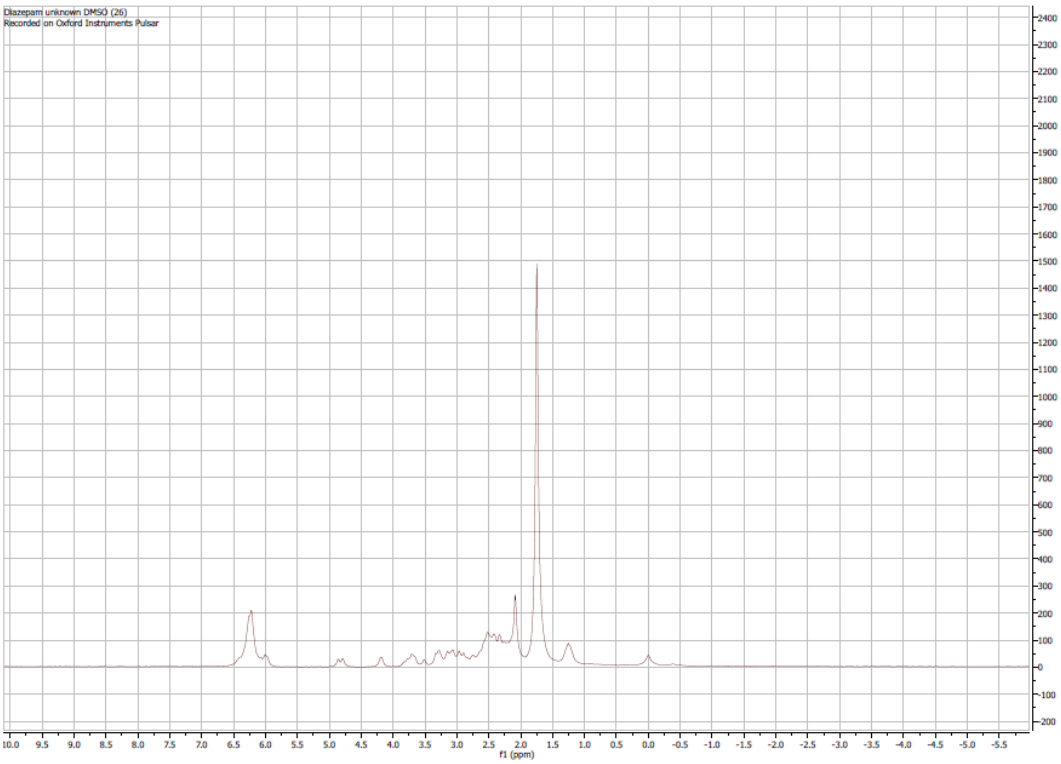


Figure 9: Sample V26 DMSO NMR spectra (Diazepam)

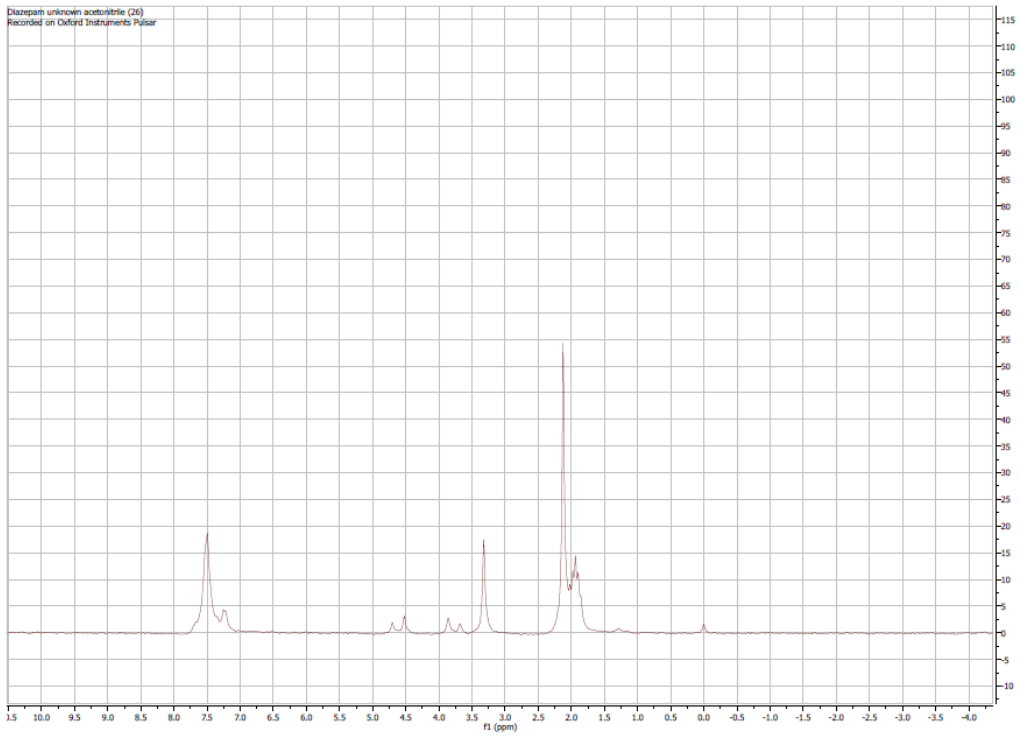


Figure 10: Sample V26 acetonitrile NMR spectra (Diazepam)

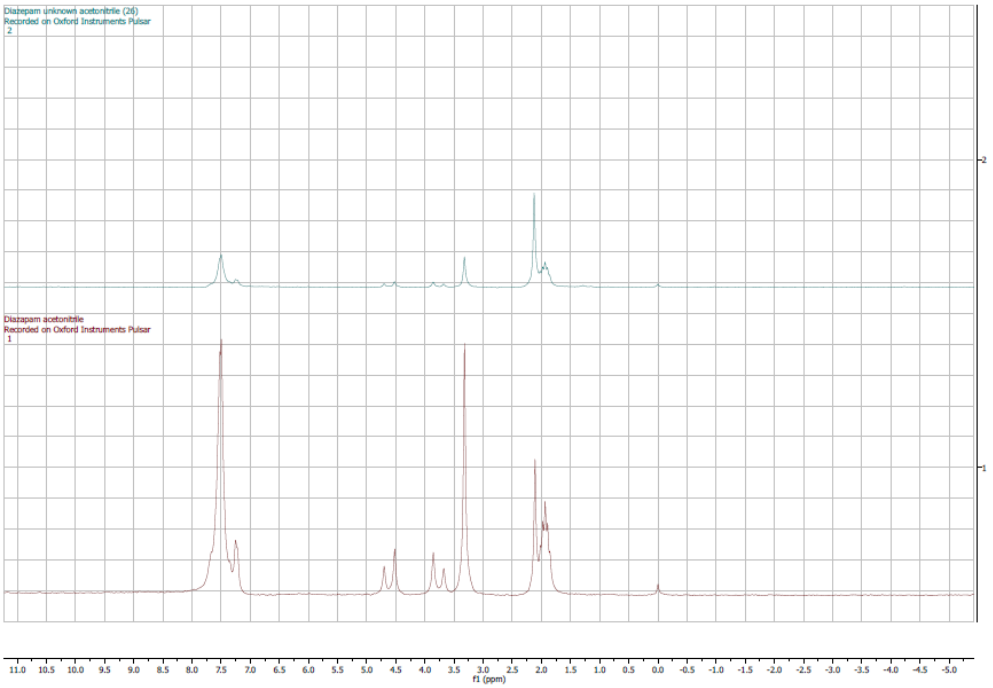


Figure 11: Sample V26 acetonitrile NMR spectra compared to the Diazepam reference acetonitrile NMR spectra

As displayed in figure 11 above, the NMR Spectra of sample V26 showed a match with the NMR Spectra of the Diazepam reference which confirms that sample V26 contains Diazepam. However, the quantity of active ingredient in the street samples remained unknown, thus the need to complete GC-MS analysis.

5.5 Gas Chromatography-Mass Spectrometry (GC-MS)

The following sub-section will outline the methodology used for GC-MS analysis. Specifically: the GC-MS settings (section 5.5.1); the preparation of the eicosane stock solution (section 5.5.2); the preparation of the reference standards (section 5.5.3); the preparation of the calibration standards (section 5.5.4) and; the preparation of the 'Valium' (section 5.5.5.1) and 'Xanax' (section 5.5.5.2) samples.

5.5.1 GCMS settings

GC-MS analysis was performed using an Agilent 7890B GC and a 5977B mass selective detector (Agilent Technologies, Wokingham, UK). An Agilent Technologies 7693 auto-sampler was used in order to perform automated injections. The mass spectrometer was operated in the electron ionisation mode at 70 Ev and separation was achieved with a HP5 MS column with 0.25 µm film thickness (30 mm x 0.25 mm i.d., 0.25 µm). Helium acted as the carrier gas at a constant flow rate of 1.2 mL min^{-1} and a 0.5 µL aliquot of each sample was injected with a split ratio of 50:1. Mass spectra were obtained in full scan mode (50-550 amu). All samples were injected three times and the total run time was 30 minutes. The temperatures of the injector and the GC interface were maintained at 280 °C. The MS source and quadrupole temperatures were set at 230 °C and 150 °C respectively.

A method was developed in order to identify Alprazolam and Diazepam in the unknown samples. The following oven temperature was developed that provided a different retention time for both active components. This can be seen in the following table.

	Rate (deg C / min)	Value (degrees c)	Hold time (min)
Initial		60	2
Ramp 1	30	290	20

Table 10: GC-MS oven temperature and hold time

5.5.2 Eicosane stock solution preparation

Eicosane was used as the internal standard. For the first method, 0.02 g of eicosane was weighed and transferred into a 100 mL volumetric flask before being filled with methanol in order to create a concentration of 200 µg mL^{-1}. This was diluted by a factor of two in order to create a 100 µg mL^{-1} stock solution which was used as the final stock solution during the preparation of the first run of all the samples.

For the second method, a new eicosane stock solution was created. 0.1 g (actually 0.1003 g) of eicosane was vigorously sonicated in a 100 mL volumetric glass with methanol, before 2000 µL was taken and added to 8000 µL of methanol to create a concentration of 200 µg mL^{-1}.

5.5.3 Reference standards

In order to determine the active ingredients in the unknown samples, it was necessary to perform GC-MS analysis using reference standard Alprazolam and Diazepam in order to compare mass spectral data.

0.005 g the Diazepam reference powder was added to 5 mL of methanol to create a 1 mg mL^{-1} solution. 200 µL of this was added to 800 µL of blank methanol to create D200 µg mL^{-1}. 500 µL of D200 µg mL^{-1} was added to 500 µL of the eicosane stock solution (method two), ready for GC-MS analysis. The Alprazolam reference standard was made up following the same method of the Diazepam reference standard.

5.5.4 Calibration standards

In order to determine the concentration levels of the unknown samples, five calibration standards of each Alprazolam and Diazepam were needed to create two calibration curves. These were later compared to the unknown samples and will be displayed in Chapter Six: section 6.2.

To make the calibration stock solution, 0.01 g (actually 0.0107 g) of the Alprazolam reference powder was weighed accurately and transferred into a 10.0 mL volumetric flask before being diluted to volume with methanol in order to create a 1 mg mL^{-1} stock solution.

Five intermediate solutions were made with different concentrations of Alprazolam ranging between 100 µg mL^{-1} – 300 µg mL^{-1}. To make the final concentration of the calibration samples, each sample had 500 µL taken and was transferred into a GC-MS vial alongside 500 µL of the eicosane stock solution used in the first method (see section 5.5.2). The final calibration standards contained 50 µg mL^{-1}, 75 µg mL^{-1}, 100 µg mL^{-1}, 125 µg mL^{-1} and 150 µg mL^{-1} of Alprazolam and the same for Diazepam[17]. See Chapter Six: section 6.2.1: figures 17 and 18: for Diazepam (detection limit: 8.1 µg mL^{-1}, quantification limit: 24.5 µg mL^{-1}) and Alprazolam (detection limit: 10.7 µg mL^{-1}, quantification limit: 32.5 µg mL^{-1}) respectively. Each calibration solution was repeated six times.

[17] 0.01 g (actually 0.0102 g) of the Diazepam reference powder was used in the same process.

5.5.5 Unknown sample preparation

5.5.5.1 Unknown 'Valium' sample preparation

All unknown 'Valium' samples were presumed to contain 10 mg of Diazepam due to their colour and correspondence to usual prescription dosage and online information (see 'MSJ/Diazepam guide' on www.substance.org.uk[18]).

Each sample was finely ground using a pestle and mortar and homogenized. After the samples were weighed, 2/10ths of each sample was taken and placed into a new 7 mL vial (see appendix 46 for 'Valium' sample weight and description). 2 mL of methanol was added to each vial in order to create a 2 mg mL^{-1} solution. All samples were filtered once using 0.2 µm filters. 200 µL of the filtered sample solution was taken and added to 800 µL of methanol to create a 400 µg mL^{-1} solution. The final solution for GC-MS analysis consisted of 500 µL of the sample solution and 500 µL of the eicosane stock solution (see 5.5.2 – method two) in order to create a final concentration of 200 µg mL^{-1}. Each sample was run three times.

5.5.5.2 Unknown 'Xanax' sample preparation

All unknown 'Xanax' samples were presumed to contain 2 mg of Alprazolam based on usual prescription dosages and online information (see 'Xanax' on www.drugs.com[19]).

Similar to the previous samples, each sample was finely ground using a pestle and mortar and homogenized before half of each sample was weighed and transferred to a new 7 mL vial (see appendix 49 for 'Xanax' sample weight and description). Each sample was handled with care and precision, and all instruments used were washed with acetone between uses to eliminate possible cross contamination. 5 mL of methanol was added to each vial using an *Eppendorf* manual pipette in order to create a 1 µg mL^{-1} solution. Samples were ultra-sonicated before the precipitated solutions were filtered twice using 0.2 µm filters. The final concentration for GC-MS analysis consisted of 500 µL of the eicosane stock solution (see section 5.5.2 – method one) along with 500 µL of the filtered sample solution.

The method was adapted for results which showed little or no peaks. For the second wave of the repeat tests, 250 µL of the second eicosane stock solution was added to 750 µL of each unknown sample to create the vials ready for GC-MS analysis. The overall weight of X27 was below the

[18] http://www.substance.org.uk/resources/msj-diaepam-guide
[19] https://www.drugs.com/xanax.html

standard weight taken for sample prep and therefore the weight taken from this sample was altered in order to create the correct concentration. Each sample was run three times.

5.6 Summary of chapter

To summarise, Chapter Five displayed a successful and a relatively quick (run time of 30 minutes) GC-MS experimental method to determine the contents and concentration levels of 29 suspected 'Valium' pills and 29 suspected 'Xanax' tablets which were seized in Manchester. The new, developed GC-MS method qualified, quantified and determined compounds that should not have been present. The reference standards were also run using the same method.

This GC-MS method may be used for further research when detecting Valium, Xanax and other benzodiazepines. Although DMSO and acetonitrile NMR testing assists in the determination of the structural characterisation of unknown samples, the lack of a database meant the results showed low match scores. Researchers are urged to create a NMR database for benzodiazepines.

The presumptive testing namely *'M.M.C. International B.V – General Screening/ Multi Party Drugs Test'* displayed no colour match with benzodiazepines on the packaging. Therefore, the slight colour change displayed by sample X16 can be concluded as a showing a false positive. This shows that this specific colour testing kit is inadequate when trying to detect benzodiazepines in unknown samples.

The following section will display the results of the GC-MS analysis.

Chapter Six: GC-MS analysis results

6.1 Introduction and chapter overview

This chapter presents the findings from the quantitative and qualitative analysis of the 29 assumed 'Xanax' bars and the 29 assumed 'Valium' tablets seized in Manchester. It will begin with laying out the reference standard and calibration results (section 6.2), which were used to match the unknown samples. Section 6.3 will present the results from of all 29 'Valium' samples including content and purity, and section 6.4 will outline the outline the same for all 29 'Xanax' samples.

6.2 Reference standards and calibration

GC-MS allowed for the visualization of the mass spectral data which can be found below. The mass spectrometry figures for Alprazolam and Diazepam are reliable as the match with previous studies (see Yilmaz and Akba, 2010; Zhang et al., 2014).

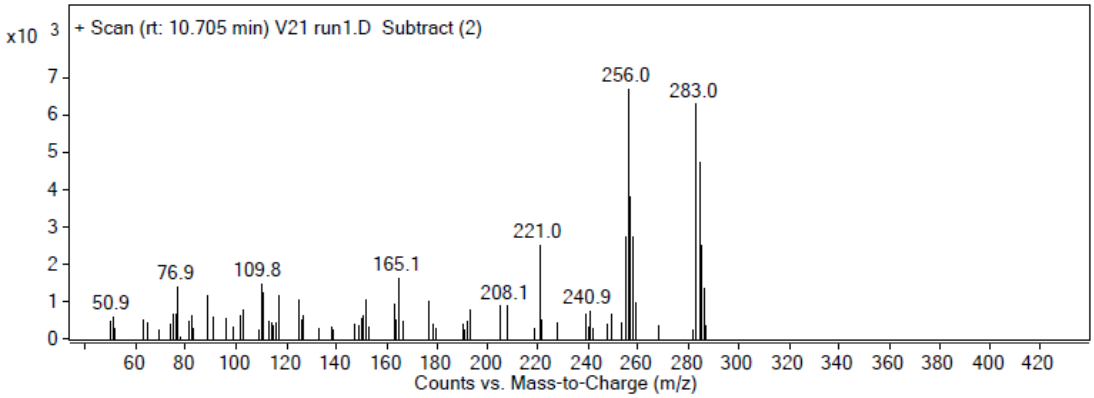


Figure 12: Mass spectra of eicosane

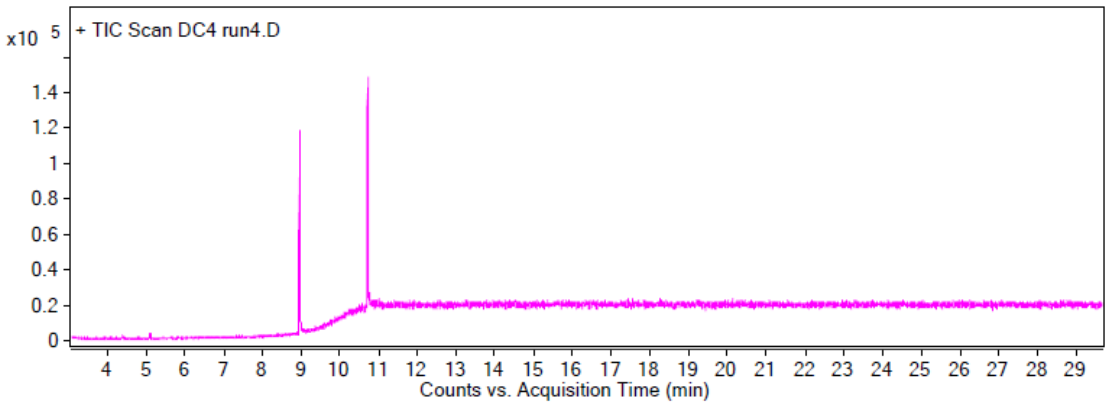


Figure 13: Gas chromatogram of Diazepam reference standard

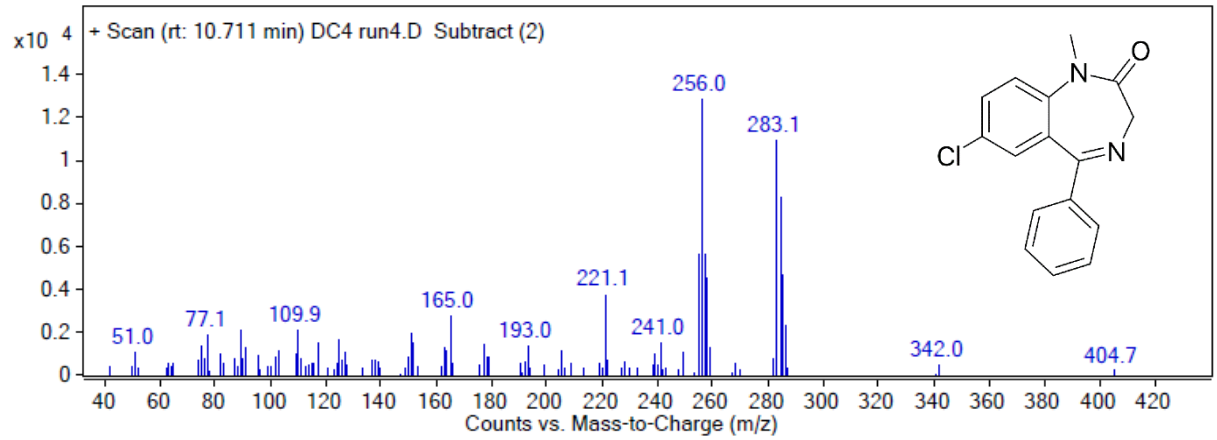


Figure 14: Structural formula and mass spectra of Diazepam reference standard

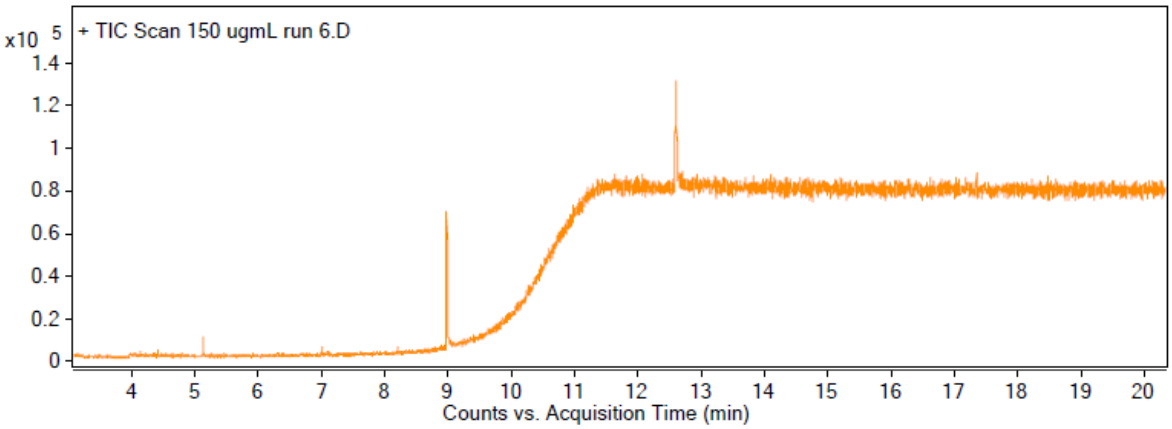


Figure 15: Gas chromatogram of Alprazolam reference standard

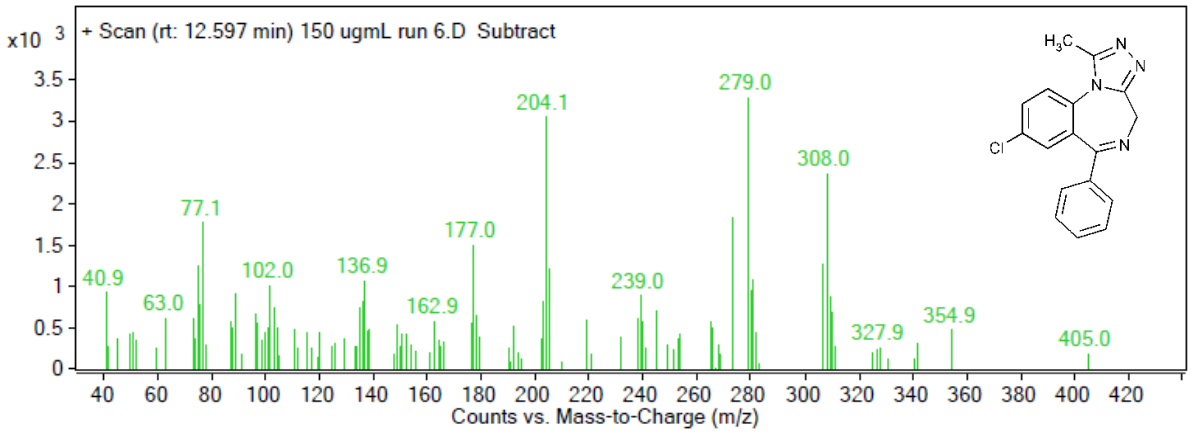


Figure 16: Structural formula and mass spectra of Alprazolam reference standard

The following table displays the retention time and mass spectrometry of eicosane, the Alprazolam reference and the Diazepam reference.

	Retention time	Mass spectrometry
Eicosane	8.976 min	57.1, 71.1, 43.1, 85.1, 99.1
Alprazolam	12.609 min	279.1, 204.1, 308.1, 273.1, 77.0, 252.1, 136.9, 177.0, 245.1, 163.0
Diazepam	10.729 min	256.0, 283.1, 221.1, 165.0, 109.9, 77.1, 193.0, 241.0, 51.0

Table 11: Retention time and mass spectra of eicosane, Alprazolam and Diazepam

The calibration graphs displayed below were used to compare data from the unknown samples in order to decipher the concentration levels of the unknown samples. Both R^{2}'d values are above the acceptable limit of 0.99 making the calibration graphs reliable for comparison.

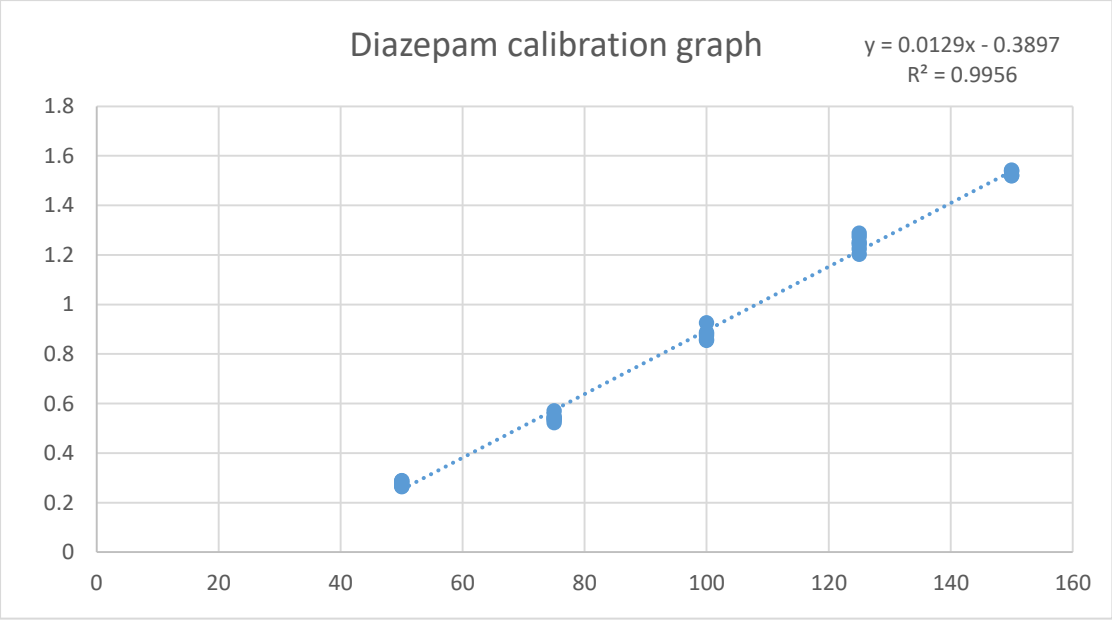


Figure 17: Diazepam calibration graph

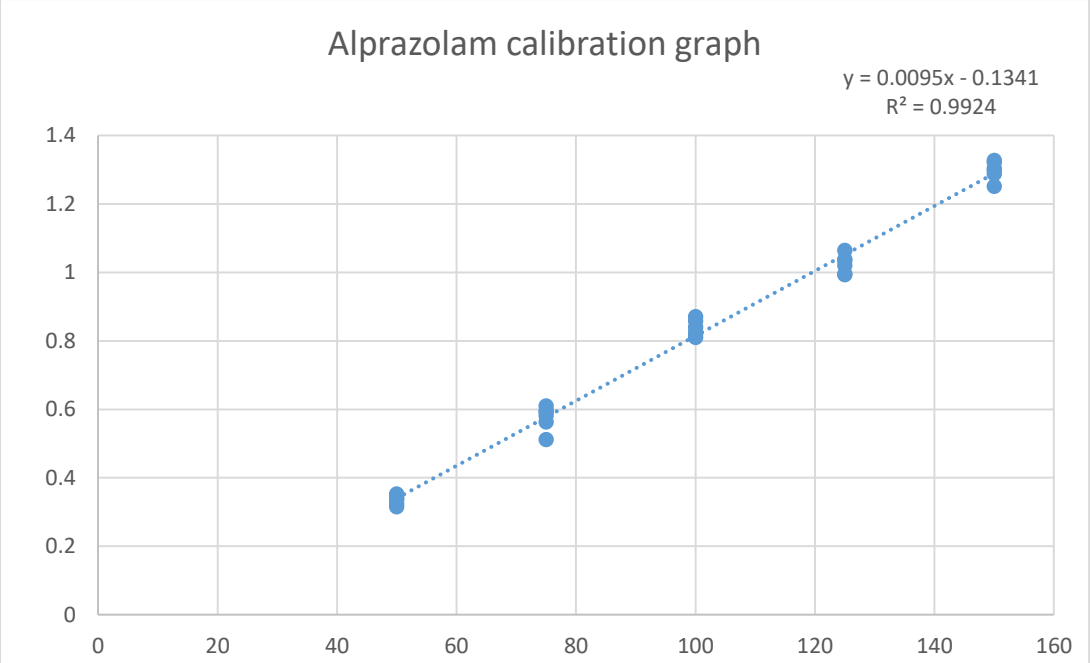


Figure 18: Alprazolam calibration graph

6.3 'Valium'

The integrated area ratio was calculated for each unknown 'Valium' sample before using the calibration formula (see appendix 54 for a screenshot of the excel document). The figures were then compared to the calibration graph (see figure 17above) in order to quantify the amount of active Diazepam (if any) in samples V1 – V29.

The amount of active Diazepam found in each sample ranged from 12.97 mg (V21) – 26.79 mg (V3). V1 contained no active Diazepam. A full table of the results can be found in the table below.

Name of sample	MG per sample (2d.p.)
V1	N/A
V2	22.21
V3	26.79
V4	21.37
V5	22.60
V6	19.87
V7	21.92
V8	20.32
V9	21.34
V10	19.94
V11	18.25
V12	19.06
V13	21.62
V14	22.02
V15	22.10
V16	21.22
V17	20.54
V18	22.27
V19	20.67
V20	15.85
V21	12.97
V22	15.99
V23	15.51
V24	15.54
V25	15.71
V26	15.93
V27	14.80
V28	16.19
V29	15.96

Table 12: 'Valium' results table V1 – V29

Generally speaking, the tested Valium pills contained either double the amount of active Diazepam (around 20 mg) or around 15 mg. This is significantly higher than what they were sold as (10 mg). These can have pose significant dangers as explored in Chapter Five: section 5.1.3.2, which will be discussed further in Chapter Seven.

Displayed below are the gas chromatograms and mass spectra of: sample V1 (no Diazepam); sample V3 (highest amount of Diazepam) and; sample V21 (smallest amount of Diazepam).

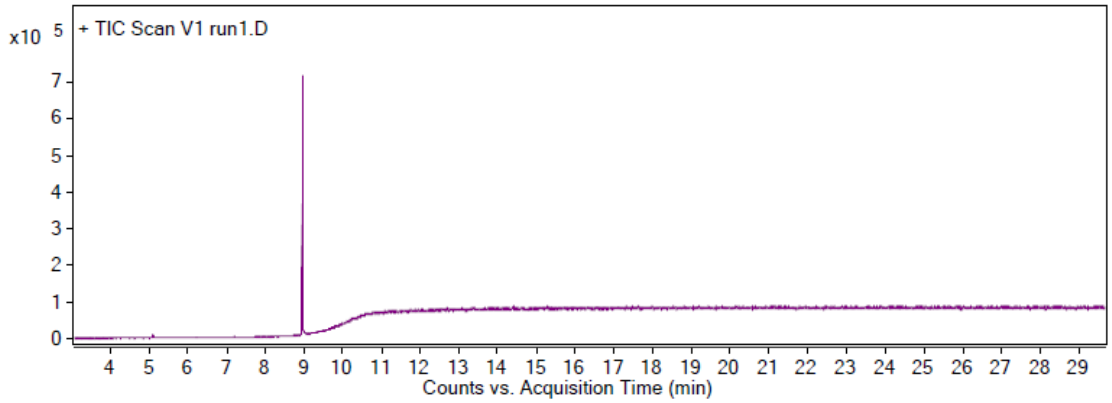


Figure 19: Gas chromatogram of sample V1 (no Diazepam[20])

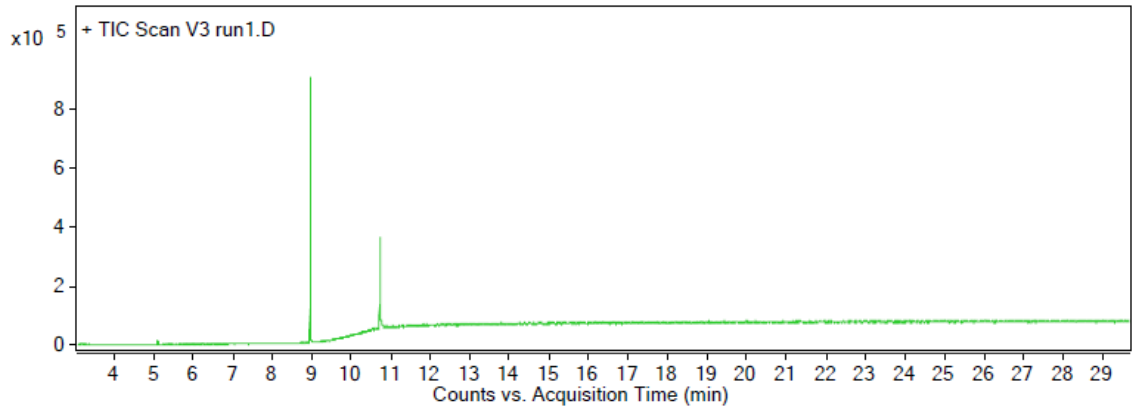


Figure 20: Gas chromatogram of sample V3 (highest amount of Diazepam)

[20] There is no mass spectra for V1 as it did not contain any active ingredients

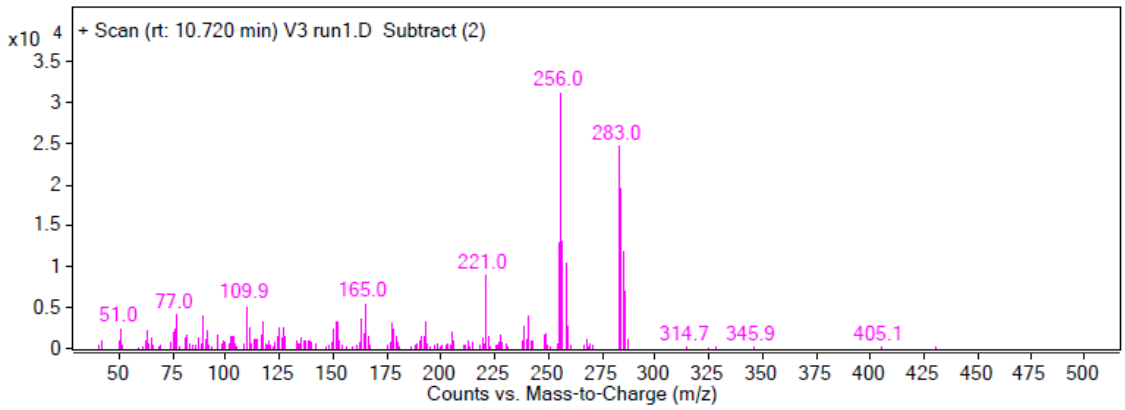


Figure 21: Mass spectra of sample V3 (highest amount of Diazepam)

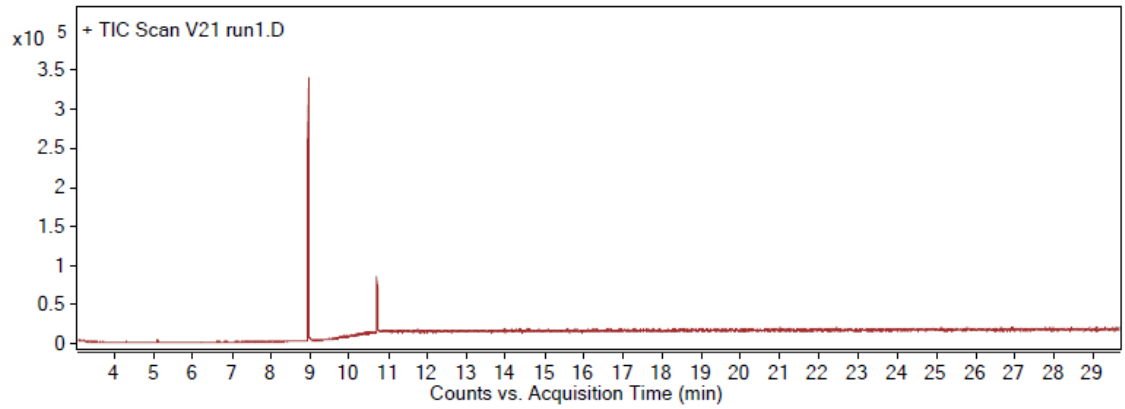


Figure 22: Gas chromatogram of sample V21 (smallest amount of Diazepam)

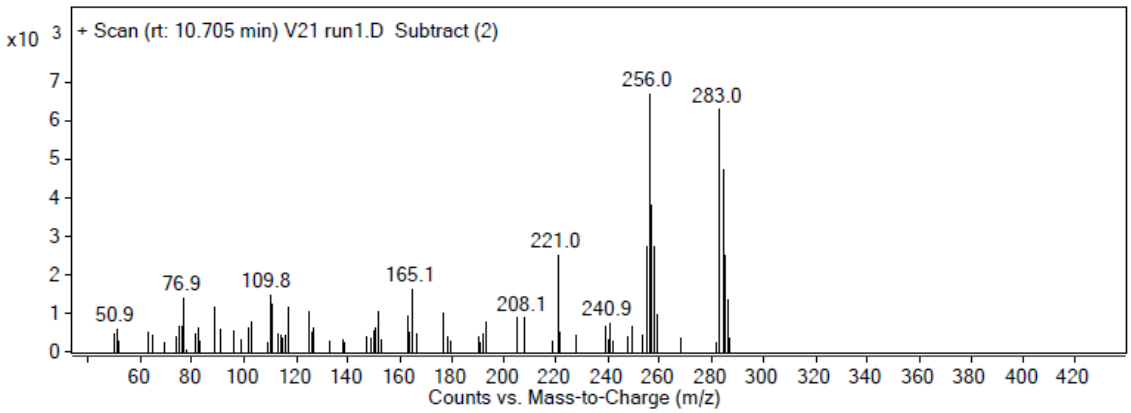


Figure 23: Mass spectra of sample V21 (smallest amount of Diazepam)

6.4 'Xanax'

The integrated area ratio was also calculated for each unknown 'Xanax' sample (see appendix 55 for a screenshot of the excel document) and compared to the calibration graphs in order to quantify X1 – X29. The figures were then compared to the calibration graph (see figure 18 in section 6.2) in order to quantify the amount of active Alprazolam (if any) in samples X1 – X29.

The amount of active Alprazolam found in each sample ranged from 0.70 mg (X15) – 2.21 mg (X1). X4, X6, X7, X9, X16 and X17 contained no Alprazolam. Sample X4 had a 559 match and a 25.9% probability score with Triazolam at 13.33 minutes. Sample X16 had a 902 match and a 91.9% probability score with Zolpidem at 11.863 minutes. A full table of the results is on the next page.

Generally speaking, excluding X1, X4, X6, X7, X9, X16 and X17, the results showed that the remaining 22 Xanax tablets contained half (around 1 mg) or less than half of their presumed amount of active Alprazolam. This is significantly less than what they were sold as (2 mg). The wide variance of mg dosage could show detrimental effects for users as highlighted in Chapter Five: section 5.1.3 and will be elaborated in Chapter 7. In addition, four samples contained no active ingredient and were cut with harmless cutting agents like glucose, and two samples contained no active ingredient and were cut with other substances: Triazolam (X4) and Zolpidem (X16). These are both benzodiazepine-like substances and it is believed they were used as cutting agents to limit costs. This will be discussed further in Chapter Seven.

Name of sample	MG per sample (2d.p.)
X1	2.21
X2	0.77
X3	1.36
X4	N/A – 25.9% match with Triazolam
X5	0.98
X6	N/A – no active ingredient
X7	N/A – no active ingredient
X8	1.19
X9	N/A – no active ingredient
X10	0.80
X11	1.18
X12	0.91
X13	0.90
X14	0.73
X15	0.70
X16	N/A – 91.9% match with Zolpidem
X17	N/A – no active ingredient
X18	0.99
X19	0.77
X20	0.82
X21	0.84
X22	1.04
X23	1.01
X24	1.02
X25	1.05
X26	0.83
X27	0.92
X28	1.04
X29	1.05

Table 13: 'Xanax' results table X1 – X29

The figures displayed below are the gas chromatograms and mass spectra of: sample X1 (highest amount of Alprazolam); sample X4 (Triazolam); sample X15 (smallest amount of Alprazolam); sample X16 (Zolpidem). GC-MS analysis was also performed on a Zolpidem reference standard (see figures 31 and 32) for extra confirmation and comparison of sample X16.

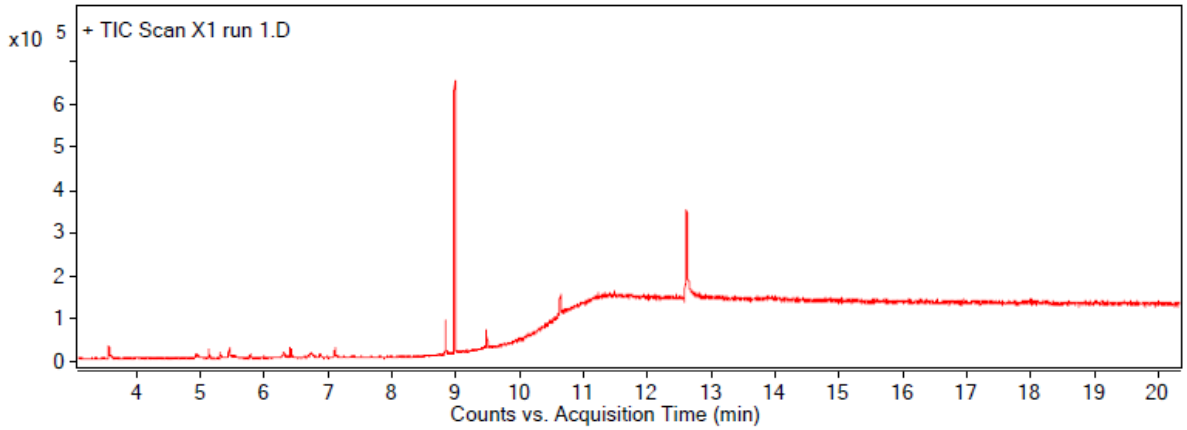


Figure 24: Gas chromatogram of sample X1 (highest amount of Alprazolam)

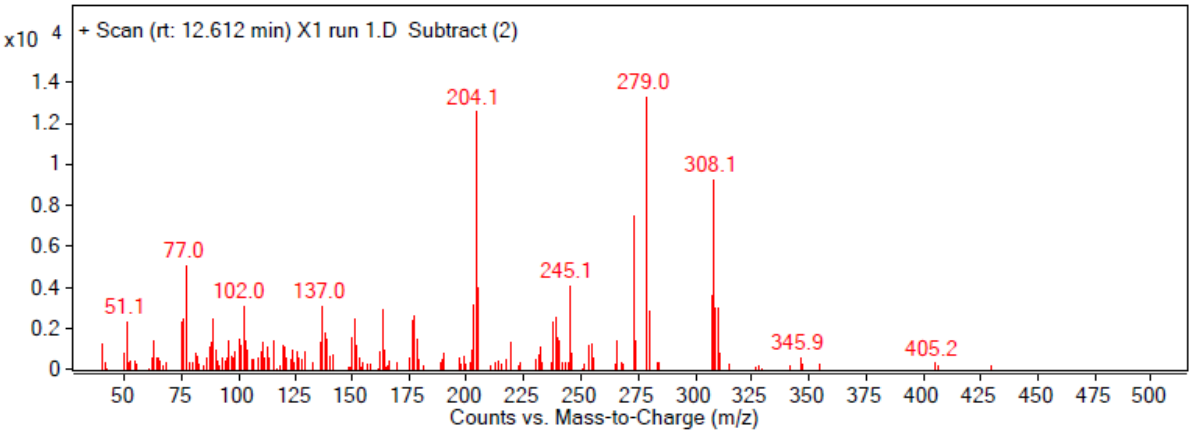


Figure 25: Mass spectra of sample X1 (highest amount of Alprazolam)

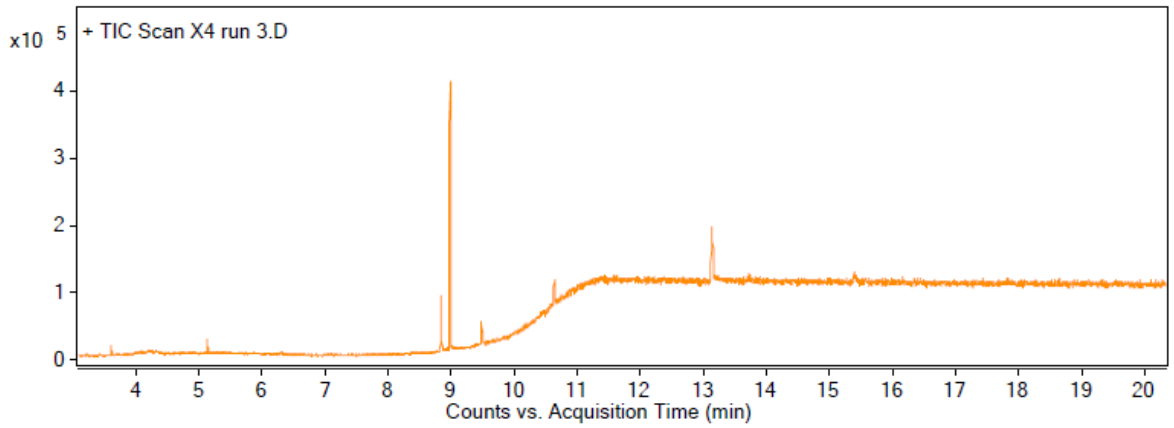


Figure 26: Gas chromatogram of sample X4 (Triazolam)

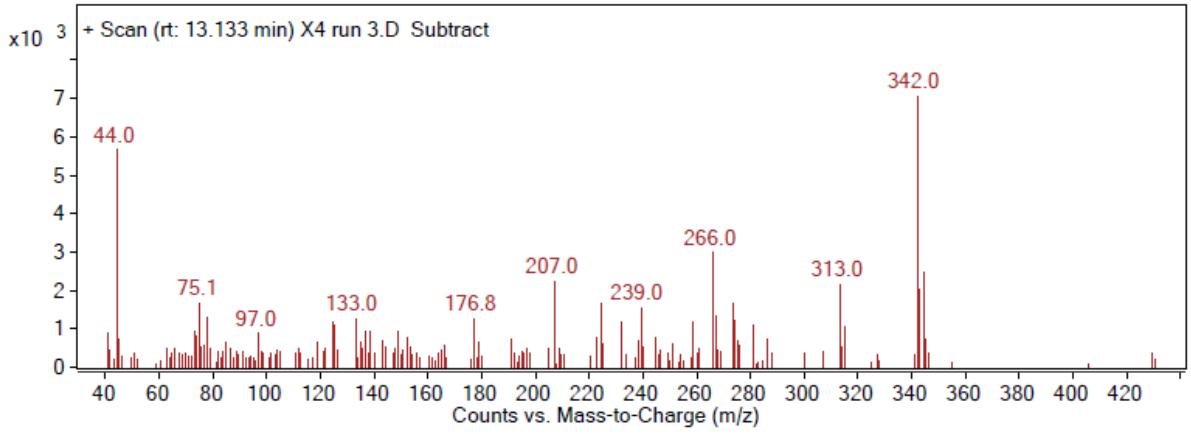


Figure 27: Mass spectra of sample X4 (Triazolam)

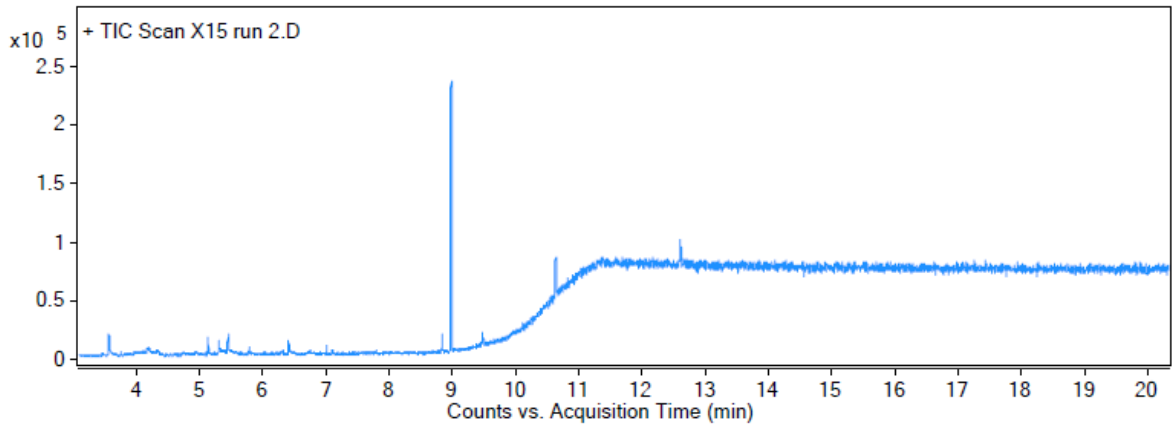


Figure 28: Gas chromatogram of sample X15 (smallest amount of Alprazolam)

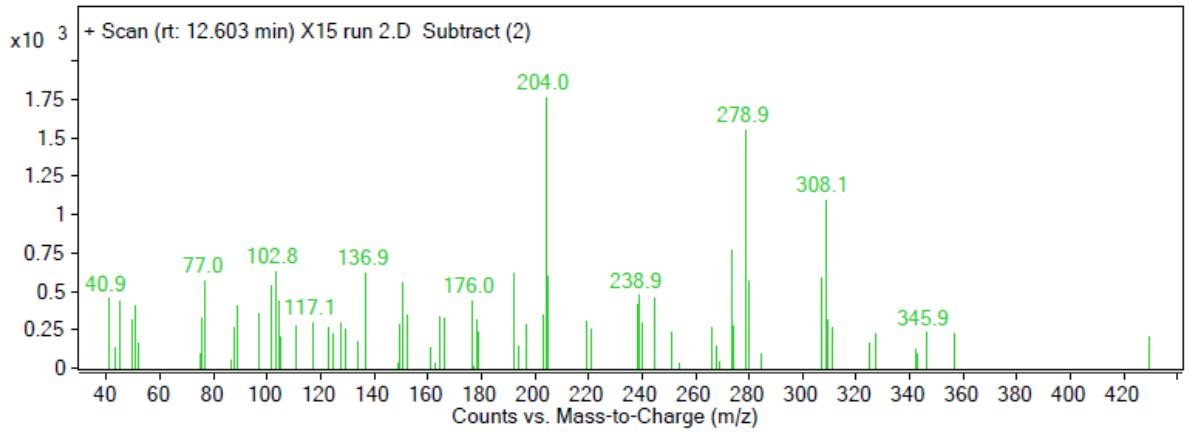


Figure 29: Mass spectra of sample X15 (smallest amount of Alprazolam)

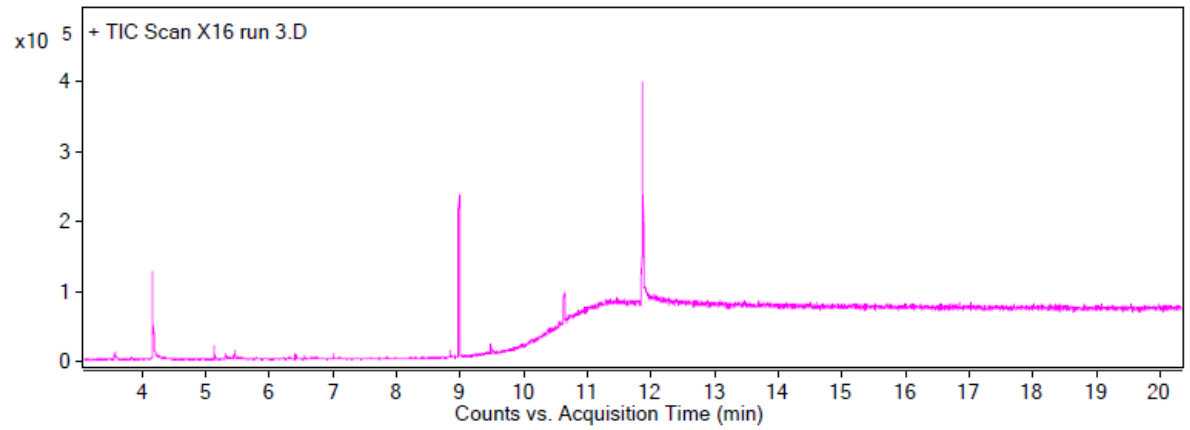


Figure 30: Gas chromatogram of sample X16 (Zolpidem)

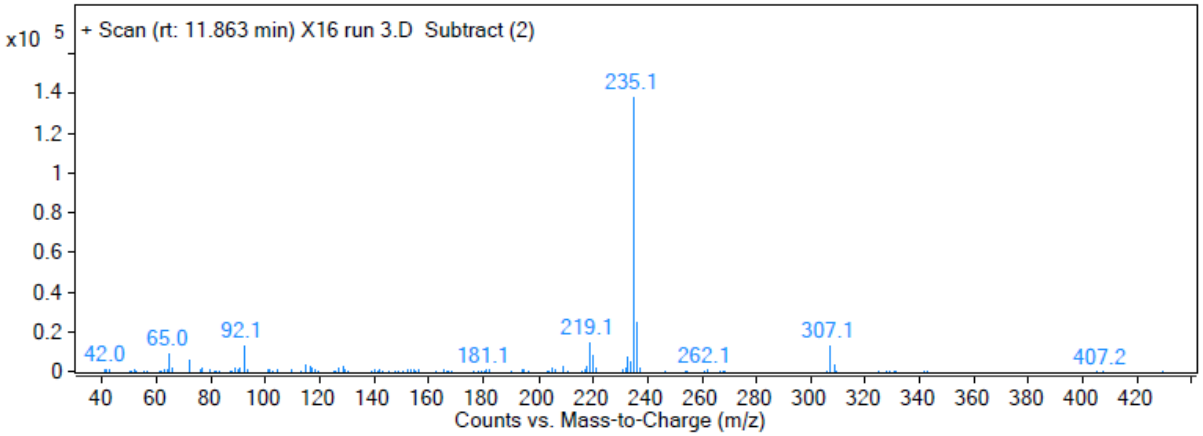


Figure 31: Mass spectra of sample X16 (Zolpidem)

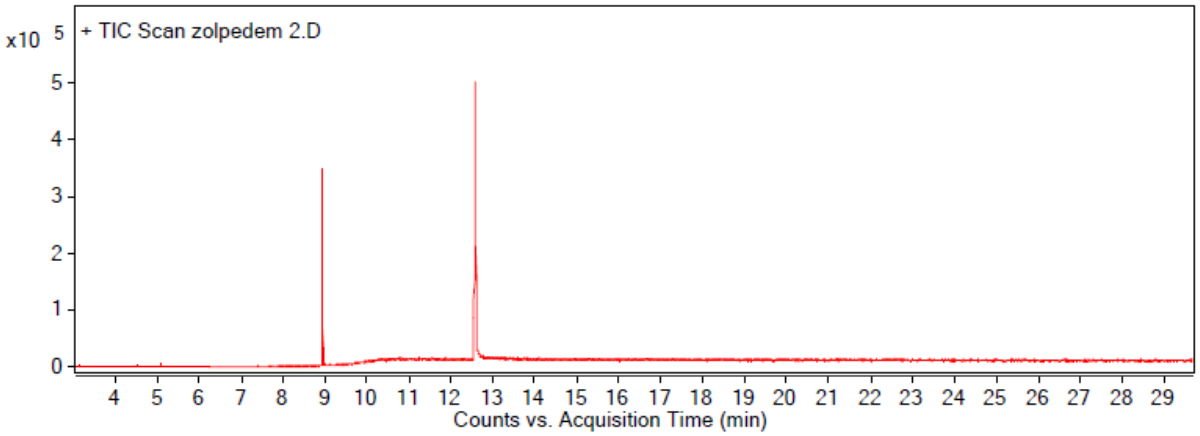


Figure 32: Gas chromatogram of Zolpidem reference standard

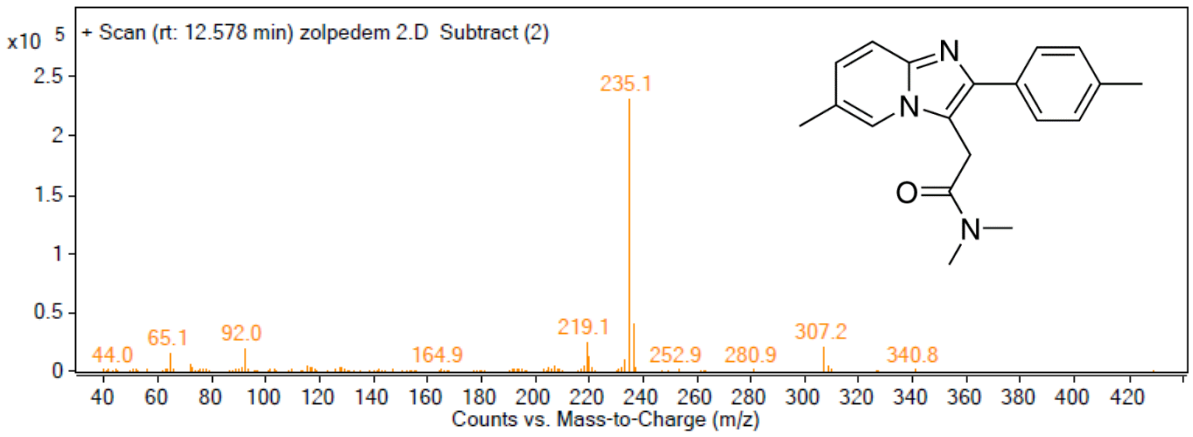


Figure 33: Structural formula and mass spectra of Zolpidem reference standard

6.5 Summary of chapter and conclusion

To summarise, Chapter Six displayed the results of 29 unknown 'Valium' samples and 29 unknown 'Xanax samples using a new, quick method of GC-MS analysis.

The 'Xanax' samples (thought to contain 2 mg of Alprazolam) ranged from 0.70 – 2.21 mg and the 'Valium' samples (thought to contain 10 mg of Diazepam) ranged from 12.97 – 26.79 mg. Six of the 29 'Xanax' samples did not contain any active Alprazolam and of those, two were cut with other research chemicals. One 'Valium' tablet did not contain any active Diazepam. The results suggest users consuming street bought Xanax, formerly believed to be adulterated in the UK as explored in Chapter Five: section 5.1.3, are in fact consuming less of the active ingredient than thought. As explored in Chapter Four: section 4.7.1, many Valium users believe they are less likely to come across counterfeits, as opposed to Xanax users, however, this has been proven to be the opposite way around. The results show that Valium users are in fact consuming much more than they believe, and Xanax users are consuming less. These results will be discussed further throughout Chapter Seven, and what they mean from a public health perspective.

Chapter Seven: Discussion, limitations and future recommendations

7.1 Introduction and chapter overview

This final chapter will consider the implications of the research findings. Key findings from the social science data presented in Chapter Four and the chemical analysis element of the research presented in Chapter Six will be revisited with the intention to reflect on what the research has contributed to answering the initial research questions outlined in Chapter One:

- Which benzodiazepines are popular?
- Who is taking benzodiazepines?
- What are the motivations for use?
- What are the effects (both desired and undesired) of benzodiazepine usage?
- Where do users source their non-prescribed benzodiazepines?
- What factors influence benzodiazepine users' decisions on what benzodiazepines they use and where they obtain them?
- What are the true contents of illicitly sourced benzodiazepines?
- Are street-bought 'Valium' tablets safer than 'Xanax' bars?

However, before discussing the key findings and implications of this study, this chapter begins with some reflections on the benefits and limitations of the research methodology (section 7.2). The following sections will go on to outline the key results from the research project, specifically: user demographics (section 7.3); prevalence and preference (section 7.4); access, availability and cost (section 7.5); user motivations (section 7.6); substance use replacement (section 7.7) and; adverse negative effects (section 7.8). Section 7.9 will highlight the key findings from the forensic testing element. Section 7.10 will conclude the thesis and specifically address: future researcher (section 7.10.1); policy makers (7.10.2); mental health services (section 7.10.3); substance misuse services (7.10.4) and; current users (7.10.5) in an attempt to spread awareness and reduce harm.

7.2 A reflection on the social science methodology – benefits for future researchers

The following section will begin by outlining the benefits of the methodology used in this research project and how it can be adopted and developed in further research. It will then highlight the limitations of each approach and their implications for future use.

7.2.1 Contribution to using social media as a research tool

The social science research methodology used a diverse range of online and offline distribution methods which led to the efficient collection of data from 771 respondents (595 after data cleaning). Using social media to access a geographically dispersed sample population has been noted in previous research (Holmes, 2009; Suri and Patel, 2012; O'Connor et al., 2014; Wolfe et al., 2014; Whitaker et al., 2017). However, the social science methodology used in the current study developed this further by specifically joining *Facebook* groups and pages to target specific populations. As highlighted in Chapter Three: section 3.3.4.1 and 3.3.4.2, the research process uncovered some noteworthy nuances around targeting student and academic population. It was discovered that the day and time of postings was an important factor to consider when reaching out to potential participants. When targeting the student population via specific University *Facebook* groups, the best time to post was between 6 and 10pm on a Sunday or Monday or in the holidays, when the pages were not inundated by ticket selling posts. In contrast, when targeting academics on *Twitter*, it was deemed best to tweet during the day as they were actively involved in discovering new papers and sharing them online. The online interaction between the researcher and potential participants via *Facebook* and *Twitter* users was considered to be extremely important with regards to gaining as many participants as possible and social science researchers are urged to use this methodology for future research.

Although there were many benefits from using social media as a research tool, there was also an overarching downside of using *Facebook* and *Twitter* to promote the survey link. The dominant ethical issue which arose from the research methods was maintaining participant confidentiality, which has been previously highlighted by other online researchers and academics (Suri and Patel, 2012; British Psychological Society, 2017; Hunter et al., 2018). For each respondent in the current study, the survey software *Qualtrics* displayed a GeoIP address, which limited the researcher's ability to assure full participant confidentiality. Future researchers must consider this when collecting data online.

7.3 User demographics

As explored in Chapter One and Two of this thesis, UK media headlines and data from the CSEW suggest benzodiazepine usage amongst children and young people has been prevalent in the last year or two (BBC News, 2018a; BBC News, 2018d; Birmingham Mail, 2018; Home Office, 2018; VICE, 2018a). The current study consisted of predominantly 18 – 21 year olds (n=422, 70.9%) and 22 – 25 year olds (n=127, 21.3%) which confirms Valium and Xanax are commonly used amongst the younger population. Some respondents made it evident that other user populations do exist, however the current research project did not represent this sample. Both males and females equally used benzodiazepines for a range of functions, however, motivations often overlapped and intertwined with one another. The research findings suggest that the use of benzodiazepines is becoming normalised amongst university students and that harm reduction reports must be issued (elaborated in section 7.10.5). Moreover, the current study revealed that although small, participants aged 26+ claimed to use benzodiazepines also (n=46, 7.7%). However, due to university ethical regulations that govern the collection of data from minors and concerns around accessing school-aged users, the decision to limit the research to 18 years and over has meant that the research cannot confirm the media reported spike in users under 18 and therefore, further research that targets this younger cohort is needed. In addition, the focus on university students has resulted in a skewed sample that does not examine the user habits and motivations amongst other non-student populations: non-university, working class young adults and; the middle-aged and older user population.

Nevertheless, despite not accessing under 18s in the current study, it is plausible that similar motivations around use and ease of access would make benzodiazepines equally appealing to this age group. Specifically, the expression of using benzodiazepines in conjunction with alcohol as a means of getting drunk quicker and for less money may be a significant motivation for children and adolescents under 18, as benzodiazepine drugs are sometimes more readily available than alcohol.

7.4 Valium versus Xanax: prevalence and preference

In Chapter's One and Two, the need for more research into the use of benzodiazepines among young adults in the UK was called for to ensure a better understanding of which benzodiazepines were used and why. Reflecting on the findings, it appears that a significant change has occurred since the Kapil and colleagues study (Kapil et al., 2014). There, it was discovered that Valium was the most frequently used and misused benzodiazepine (n=62, 53.4%) followed by Lorazepam (n=26, 22.4%) and Xanax (n=20, 17.2%). UK media reports also reported Valium more than any other

benzodiazepine (see Chapter Two: section 2.4: table 3). However, data from the current study showed that although more respondents had tried Valium (n=499, 83.9%) as opposed to Xanax (n=481: 80.8%) at some point in their lifetime, for recent usage (in the past 2 months[21]), respondents had used more Xanax (n=313, 52.6%) than Valium (n=273, 45.9%). This data reveals that the reported use of Xanax has increased significantly since 2014, from 1 in 6 individuals (17.2%) to over 1 in 2 individuals (52.6%).

When justifying their preferences, many users contradicted one another. Many disliked Xanax due to its potency, however many preferred this as it was better value for money. A positive conclusion to draw from this is that users are aware of the difference in potency. However, more information must be given to users to spread awareness. Benzodiazepine preference was split fairly equally (Valium: n=276, 46.4%; Xanax: n=265, 44.5%). However, it was noted that more males preferred Xanax (m=47.2%, f=41.4%) and more females preferred Valium (f=50.6%, m=42.6%). It was also discovered that Xanax was more popular amongst those aged under 21. This gender and age difference is something that warrants further research and exploration.

7.5 Access, availability and cost

7.5.1 Price

Prices varied greatly dependent on the source, and some have once paid as little as 15p per Valium and 30p for a Xanax; a significant finding was that benzodiazepines are generally only available to buy in bulk. However, respondents stated they usually pay £1 per Valium pill and £2 for Xanax, which suggests users usually spend around £2 per occasion based on that fact that the majority of Valium users take 2 tablets and Xanax uses take 1 to get to sleep (V=108, 32.7%; X=125, 37.9%), to self-medicate (V=69, 35.4%; X=125, 37.9%), to get high (V=107, 29.1%; X=146, 39.7%) or to counteract stimulants (V=124, 33.6%; X=157; 42.5%). The low cost of these drugs can be seen as a significant motive for benzodiazepine users when compared to other drug pricings which produce similar effects such as ketamine (£20 - £30 for 1 g) or cannabis (£10 per gram[22]).

7.5.2 Source

On the contrary to Kapil et al.'s 2014 study who discovered the main source of benzodiazepines to be via prescription from a health care professional (n=64, 55.2%) followed by friends and/or family

[21] The survey ran from the 1st March 2018 – 8th June 2018 therefore 'recent usage' accounts for 1st January 2018 – 8th April 2018

[22] Prices based on anecdotal evidence, in Greater Manchester

(n=46, 39.7%), the internet (n=31, 26.7%), street dealers (n=23, 19.8%) and abroad (n=13, 11.2%), the main sources for benzodiazepine users from the current study were via a dealer (n=350, 57.1%) and/or friend (n=316, 53.1%). Over a quarter of individuals sourced their benzodiazepines via the dark-web (n=172, 28.9%) and only a small fraction of individuals sourced them on the clear-web (n=27, 4.5%). A handful of respondents also stated they obtain their benzodiazepines abroad in countries like Thailand. This information suggests there has been a significant shift away from sourcing benzodiazepine drugs via legitimate means and instead, through buying them online, current users are more likely to purchase non-pharmaceutical quality benzodiazepines of variable content.

The link between street dealers and selling specific groups of drugs was noted: benzodiazepine dealers also supplied ketamine (n=113, 19%) and/or cannabis (n=90, 15.1%). This may be because depressant-like substances attract a specific pool of substance users and dealers prefer to be consistent. Alternatively, dealers may only be comfortable dealing substances which produce similar effects. Future researchers are urged to explore this link further.

Chapter Four: section 4.4.3 showed that Xanax users have been deterred due to their usual source being unreliable. This appears to offer support for policy makers and law enforcement initiatives that targeting supply routes does have an impact on users' decisions to purchase drugs.

7.6 User motivations

The following section will highlight the key motivations for the non-prescribed use of benzodiazepines as stated by the 595 participants in the current study. The data will be compared to existing knowledge highlighted in Chapters One and Two.

7.6.1 Multifunctional use

Even though the majority of non-prescribed users sourced their benzodiazepines from non-prescribed sources, many still took them for their licensed purposes. Over half of respondents in the current study took benzodiazepine's to help sleep (n=330, 55.5%), compared to two-thirds in of respondents in Kapil et al.'s study (n=77, 66.4%). A third of those in the current study used them for anxiety related issues (n=195, 32.8%), similar to the 2014 study (n=43, 37.1%). However, although the UK media dominantly focuses on self-medicating individuals, respondents from the current study also revealed a number of other motivations for non-prescribed use. The majority did so to: counteract the effects of stimulants (n=369, 62%), almost a 6-fold increase from Kapil et al.'s study (n=12, 10.3%); closely followed by using them to get high (n=368, 61.8%), which is double the

amount using them 'for social reasons' and 'to get high' in the 2014 study (n=36, 31% and n=28, 24.1% respectively). The UK media have ignored this population of users; however, they must be acknowledged and aware of poly-drug use dangers (elaborated further in section 7.8.4). Qualitative answers also revealed that benzodiazepines are used: to boost confidence prior to meeting peers or for high-pressure situations like presentations or exams; to sleep on long journeys; to ease or eradicate the negative effects associated with a hangover or comedown; to correct irregular sleep patterns and/or to ease physical pain. Therefore, the multi-functionality of benzodiazepine use found in this study goes beyond the self-medicating narrative that is dominant in the existing media discourse highlighted in Chapters One and Two.

7.6.2 Counteract other drug effects

A possible causation for the 6-fold increase in using benzodiazepines to counteract stimulants as described in the previous sub-section may be due to the recent increase in stimulant and amphetamine purity and potency, and the need for more effective drugs to wind down (see Chapter Five: section 5.1.3.2: EMCDDA, 2016b; EMCDDA, 2018). Researchers are urged to explore this link further.

However, users from the current study also reported using benzodiazepines to come down from study drugs such as Modafinil or Ritalin, and to counteract the unwanted side effects from hallucinogenic drugs. This is new information regarding the non-prescribed use of UK users and must be explored more in-depth.

7.6.3 Self-medicating leading to problematic usage

Although many users praised Xanax and Valium for their anxiolytic properties, a few respondents stated they initially took the drugs to ease or eradicate anxious thoughts that then developed into psychological and physical dependency and debilitating withdrawal symptoms such as rebound anxiety and psychotic episodes. This evidence is especially useful when informing health care providers and policy makers to prevent problematic usage. Many respondents, particularly males, also spoke of the inefficient support from mental health treatment services (see Chapter Four: section 4.5.2). Although the Government is aware of the inadequate help and is actively attempting the improve access to treatment services as in their 2014 report launch (see Department of Health, 2014), participants from the current study still complained about the weak efficacy of traditional treatment methods and the slow access to services even over four years after the report was published. Thus, it is advised that more measures are put in place for those suffering from anxiety, depression and other mental health issues: in schools, colleges, university as well as in the

community in order to prevent adverse negative effects, dependency and rates of benzodiazepine-related mortality. Those who are vulnerable to using and misusing benzodiazepines must be helped *before* they fall into bad user habits. This will be elaborated in section 7.10.2 and 7.10.3.

7.7 Substance use replacement

Although it was a controversial topic and despite the recent medicalisation of cannabis in the UK, many survey participants claimed to prefer benzodiazepines as opposed to cannabis for relaxation and/or recreation as the latter *caused* anxiety, paranoia and unwanted hangovers. Cannabis use as a whole has dropped over 8% from 1996 (39.1%) to the most recent year (30.7%) (Home Office, 2018). A potential explanation for this shift may be due to the growth in adverse cannabis strains containing higher levels of THC in recent years. Researchers are urged to explore the shift in cannabis use from a user's perspective and explore the variation of cannabis strains.

Moreover, in the most recent Crime Survey for England and Wales, figures show that although illicit drug use in the year 2017/18 has increased from the previous year, those aged 16-24 reported a significant drop in overall drug use compared to the year of 1996. Twenty years ago, nearly half (48.5%) of young people had reported use of an illicit substance, whereas in the most recent report of 2017/18, it was merely just over a third (34.8%). Furthermore, 19.4% of young people admitted use of a class A at least once in their lifetime 1996, compared to 15.3% of 16-24 year olds in 2017/18. Ecstasy and hallucinogen use have dropped from 11.7% and 16.1% in 1996 to 11.3% and a mere 6.6% in 2017/18 respectively. Whilst these government statistics suggest that traditional drug use is on the decline, results from the current study suggest they are being replaced with prescription drugs in a self-medicating context to treat the problems that accompany modern life for young people in the UK such as social media, body image, soaring house prices and crippling university debt, pressure in higher education and increased expectations on young people to achieve. However, this research project did not focus on the underlying motivations for self-medicating users and thus, social researchers are urged to examine the root causes of anxiety in teens and young people in order to tackle the root of the issue.

Furthermore, the move towards depressant drugs may play an important factor in determining new substance use trends. The first figures regarding ketamine in England and Wales use was collected in 2006/07 (2.3%) which have now doubled (4.7%) (CSEW, 2017/18). Ketamine is frequently used in club-drug scenes, commonly for after parties when individuals wish to come down from stimulant drugs like ecstasy (Moore and Measham, 2009), and the rise in depressant substance usage may be due to drug users wanting to chase a different type of high.

7.8 Adverse negative effects and dangers

Chapter Two: section 2.7 examined the adverse negative effects of benzodiazepines as discovered in previous studies and reports (see Gardner and Cowdry, 1985; Bond et al, 1991; Bond and Silveira, 1993; O'Sullivan et al, 1994; Longo and Johnson, 2000; Ashton, 2002; Payton, 2002; Friedman, 2006; Lader, 2011; Griffin et al, 2013; Ford and Law, 2014; Andersson and Kjellgren, 2017). However, what we did not know is the side effects from non-pharmaceutical grade benzodiazepines. Participants in the current study confirmed that benzodiazepines caused: black-outs; total memory loss; the feeling of invincibility which often led to bad decisions and/or accidents and injuries; heightened levels of anxiety; hangover effects such as grogginess, feeling sluggish and spaced out the few days after usage; headaches; drowsiness and instability; cognitive decline and; poor concentration ability.

The following section will elaborate these points further and highlight the deleterious effects, specifically: black-outs and memory loss (section 7.8.1); invincibility and erratic behaviour (section 7.8.2); driving (section 7.8.3); poly-drug use, consuming excessive amounts and mortality (section 7.8.4); dependency, tolerance and withdrawal (section 7.8.5).

7.8.1 Black-outs and memory loss: vulnerability

Previous studies have highlighted the effects of benzodiazepines on consciousness and memory (see Block and Berchou, 1984; Barker et al., 2004; Michael et al., 2007) which was also stated by participants in the current study. Personal stories highlighted the true seriousness of benzodiazepine misuse, especially from a user who spoke of once being spiked with benzodiazepines (Chapter Four: section 4.8.1) and another who could not recall having sexual relations whilst he was intoxicated (see Chapter 4: section 4.8.2). Users and service providers must be made aware of the inherent dangers of misuse, as users become exceptionally vulnerable to sexual exploitation and risk taking behaviour.

7.8.2 Invincibility and erratic behaviour

Previous academics have mentioned benzodiazepine use resulting to erratic behaviour and sometimes indulging in criminal behaviour (Gardner and Cowdry, 1985; O'Sullivan et al., 1994; Paton, 2002; Griffin et al., 2013; Ford and Law, 2014; Andersson and Kjellgren, 2017). The current study revealed that benzodiazepine users reported abnormal and sometimes criminal acts, such as: stealing; destructive behaviour and; violence. This suggests that the implications of benzodiazepine usage go beyond the user, with effects on the wider society.

7.8.3 Driving

Similar to the study by Verster et al. (2002), drowsiness was felt whilst driving a day after usage, with users saying that they fell asleep at the wheel (see Chapter Four: section 4.8.1). As Baldwin et al. (2013), Griffin et al. (2013) and Ford and Law (2014) explained, due to long elimination half-lives of active metabolites, sedative effects can be felt even up to 4 days after use (see Chapter Two: section 2.2.3). Benzodiazepine users must be aware of the long-lasting side effects and should not drive or partake in other complex psychomotor tasks after usage.

In addition, a handful of participants said they drug-drove and some even crashed. The lack of concentration ability, psychomotor skills and feeling *'invincible'* is a side effect particularly when benzodiazepine usage is excessive or combined with alcohol consumption. Awareness of these issues must be raised amongst users and will be elaborated in section 7.10.5.

7.8.4 Poly-drug use, consuming excessive amounts and mortality

The majority of benzodiazepine users in the current study used benzodiazepines alongside other drugs, in particular, alcohol (n=395, 66.4%). As explored in Chapter Two: section 2.7.5, the concurrent use of multiple depressant substances is extremely concerning as vital bodily functions are significantly depressed and may lead to coma or death, and all adverse effects are amplified when benzodiazepines are used with alcohol, making this territory a cause for concern. Users must be made aware of substance interactions and consider this when they consume benzodiazepines. Without correct guidance and knowledge, adverse negative effects and fatalities can occur.

As highlighted in Chapter Four: section 4.5.5, a dominant motivation for some benzodiazepine users is to counteract the effects of stimulants. This poly-substance use, often following a prolonged period of use of alcohol, stimulant and hallucinogenic drug use, has implications for harm reduction advice. From a public health perspective, the findings suggest that users must be made aware of the risks that arise from drug interactions stemming from poly-substance use in order to reduce harm. In particular, the effects of combining stimulants with central nervous depressants and the combining of multiple central nervous depressant drugs such as alcohol, ketamine and benzodiazepines. This warrants the need for future research, particular the use of benzodiazepines in post-clubbing setting.

Moreover, service providers must be aware that some users consume excessive amounts which, of course, incur greater risks and dangers. In the current study, a small amount of users took 6- 10 Valium to get high (n=14) or over 10 (n=12). Xanax users took 3 to get high (n=34), 4 (n=16), 5 (n=9)

or over 10 (n=1). This is especially alarming as it is significantly higher than the recommended amount. Subsequently, this could result in detrimental effects such as severe depressant of the central nervous system, especially when mixed substances like alcohol, ketamine or cannabis.

A few participants said they had lost friends to benzodiazepine overdose, which highlights the significance of this phenomenon even more. In the one-to-one interview, the participant spoke of a friend dying from mixing other drugs with Xanax. One survey respondent also spoke of losing friends, though it was to Valium. This confirms that both Xanax and Valium are equally as dangerous when they are used in conjunction with other drugs and awareness must be spread to limit fatalities.

7.8.5 Dependency, tolerance and withdrawal

Evidence suggests benzodiazepine users are sometimes using the drugs for extended periods of time and at high dosages, thus increasing the likelihood of becoming dependent. This raises cause for concern as to whether GPs or treatment services in the UK are sufficiently equipped to provide adequate support and tapering methods for those increasingly in need. Specific action is needed *before* users become tolerant.

7.9 Chemical analyses of Manchester street samples

Chapter Five outlined a new, successful method for the quick determination of the content of benzodiazepines which is urged to be used in future research. As highlighted in Chapter Five: section 5.1.4, substance testing charity *The Loop* is proactive in clubs and music festivals across the nation. However, with a strong focus on the clubbing scene and thus, testing mainly stimulant substances like MDMA and cocaine, sedative drugs like benzodiazepines are often forgotten about. The social science data from this study confirms that benzodiazepines, in particular Valium and Xanax, are widely used by individuals in the UK and after chemically analysing seized street samples, many are of varied purity or counterfeited. Substance testing facilities like *The Loop* are urged to also test substances used outside the clubbing scene in order to spread awareness and reduce harm.

Firstly, the outcomes of the presumptive testing showed that although benzodiazepines are not listed in the multi-party drugs test, it can be used to identify other adulterants. The results of this study can be used as a recommendation that this specific colour test is inadequate to identify benzodiazepine compounds in an unknown substance.

7.9.1 Purity levels and perception of risk

Generally, Kapil et al.'s study revealed that 10% (n=12) of benzodiazepine users did so as they believed the family of drugs were safer than illicit street drugs. However, it was assumed that users in the current day would be obtaining their benzodiazepines from non-legitimate sources and thus, the perceived risk would be much higher.

In the current study, many participants believed that Valium had a better chance of being legitimate and thus, safer to use (see Chapter Four: section 4.7.1). Many also believed that Valium is much less potent than Xanax. However, the forensic testing element of this project revealed that almost all 'Valium' tablets (assumed to be 10 mg) contained over 15 mg of active Diazepam, and half of the samples (n=14: V2 – V5, V7 – V9, V13 – V19) ranged from 20.32 mg – 26.79 mg, which is over double the presumed mg. As explored in Chapter Five: section 5.1.3.2, dealers may be making them super strength as they are cheap to produce and/or to increase their clientele base. One 'Valium' sample contained no active ingredient. On the other hand, the tested 'Xanax' bars ranged from 0.7 mg – 2.21 mg. Six samples contained no active Alprazolam, of which, two were cut with other benzodiazepine-like substances (X4 contained Triazalom; X16 contained Zolpidem). Although no harmful substances were found to have adulterated all 58 samples, levels of purity varied significantly. These results confirm that any illicitly sourced substance has the potential to be illegitimate, and the perception that street-bought 'Valium' is safer and less potent than 'Xanax' is incorrect.

However, this research focused solely on Greater Manchester samples. Little is known about street-bought benzodiazepines in other regions in the UK. More testing is needed.

7.10 Conclusion and future recommendations

Drawing upon key findings as displayed throughout this chapter, harm reduction reports must be issued to GPs, service providers, policy makers and the wider community which illustrate the nature and context of non-prescribed benzodiazepine use: which benzodiazepines are popular and why; where they are accessed and for how much; the motivations behind use; the inherent dangers stemming from usage. Reports need to be drafted and issued to all benzodiazepine users to prevent adverse negative effects, tolerance and dependence. If individuals still wish to engage with benzodiazepines, they must be made aware of how to take them properly and they must be aware of the dangers they bring.

This thesis will conclude with a series of future recommendations to the following: future researchers, and explore more avenues of social or analytical science research (section 7.10.1); policy makers (section 7.10.2); mental health service providers (section 7.10.3); substance misuse organisations and charities (section 7.10.4) and; current users (section 7.10.5). It draws upon the key findings using existing and new knowledge in order to minimise harm and fatalities stemming from benzodiazepine use and misuse. The following section will summarise the key findings of this research project and the implications for each.

7.10.1 Message for future researchers

7.10.1.1 Social science

The qualitative and quantitative survey design primarily focused on collecting: user demographics and motivations for usage; which benzodiazepines are most popular and why; the source of benzodiazepines and; the effects (desired and undesired) from usage. As outlined in section 7.7, some respondents also suggested they chose benzodiazepines as opposed to any other sedative drug due to a number of reasons. However, the underlying motivation for self-medicating users was not discovered. Future research is needed to unpick possible causations for anxiety in teens and young people.

Scientific researchers are urged to adopt the survey methodology outlined in Chapter Three, and carry out research into the non-prescribed use of benzodiazepines in other regions of the UK. More research is also needed into other benzodiazepine user groups, specifically: those under the age of 18; the young, non-student population; working-class individuals and; the older user population.

Additionally, researchers are urged to further explore the recreational use of benzodiazepines in a post-clubbing context, and to discover the effects of poly-drug use. Specifically: benzodiazepines and study drugs such as Modafinil; benzodiazepines and stimulants like MDMA and cocaine and; benzodiazepines and depressant substances like ketamine.

Substance use replacement was touched upon throughout this research project, however it still remains relatively undiscovered. Researchers are urged to explore the shift away from traditional harder drugs to prescription drugs and CNS depressant drugs. Researchers are also urged to explore the link between street dealers supplying specific groups of drugs.

In addition, there is a dearth of knowledge in the field of the sales of specific drug groups. Researchers are encouraged to explore the link between street dealers supplying specific groups of drugs.

7.10.1.2 Forensic testing

This research project has highlighted the importance of substance testing and thus, more testing needs to be done in other areas. Currently, drug testing services such as *The Loop* focus on people in a clubbing context. This research suggests that benzodiazepines are frequently taken *prior to* a night out or *after* a stimulant session and therefore the drugs are not on their person while they are near these testing facilities. It is advised that more accessible testing centres are put in place for those wanting to examine the contents of their benzodiazepines. For example, home testing kits which account for benzodiazepines, or installing accessible testing facilities on university campuses.

In addition, researchers are urged to create a benzodiazepine database for NMR to ensure quick analysis.

7.10.2 Message for policy makers

It's been over four years since the 2014 NHS report stating the plan to improve access to treatment services but this has clearly failed for some. The current study has proven that current mental health services in the UK are not fully adequate in treating mental health issues amongst young people: individuals choose to illicitly source benzodiazepine drugs for personal use in order to self-medicate as opposed to seeking other treatment. As explored in Chapter Five and Six, street-bought benzodiazepines are often counterfeited and thus, may lead to adverse negative effects or fatal overdose.

With teenage suicides having risen by 67% since 2010, mental health is clearly an overarching priority and more measures must be put in place to avoid deaths, and to avoid young people feeling the need to illicitly source possible counterfeit medications. This research also revealed that some benzodiazepine users take excessive amounts to intentionally overdose when they were feeling low. With the growth of online drug markets and street dealers, and costing around £2 per occasion, this makes benzodiazepines an accessible option.

However, Xanax users have been deterred due to their usual source being unreliable. This appears to offer support for policy makers and law enforcement initiatives that targeting supply routes does have an impact on users' decisions to purchase drugs.

This is a national health issue. It is absolutely vital that more money is invested into this sector and additional methods of treatment exist in order to prevent problems of drug dependency, adverse negative effects and mortality. Governmental bodies are advised to invest more money into mental health services and charities, to appoint more bodies who are equipped to deal with the diverse range of individuals' issues.

7.10.3 Message for mental health service providers

Firstly, more research needs to be done to examine the causations of mental health problems. The current study did not stretch so far as to examine the underlying causes of anxiety in young people. Researchers are urged to carry out this research. Then, root causes of anxiety must be targeted and overcome *before* the individual chooses to use benzodiazepines to self-medicate. As explained in the previous sub-section, more adequate mental health treatment services must be put in place in order to tackle anxiety and depression efficiently, such as: less stigmatisation, better access to treatment, awareness in schools, colleges, university, at home and in the community. Most importantly, mental health service providers must be made aware of the context, content and motivations for benzodiazepine usage. Thus, key data from this research project must be condensed and issued to those relevant.

7.10.4 Message for substance misuse organisations and charities

Similar to the sub-sections above, substance misuse organisations and charities who deal with the problematic aspects of use must be made aware of the context, content and motivations for benzodiazepine usage. Thus, key data from this research project must be condensed and issued to those relevant. Adverse negative effects, in particular black-outs and memory loss, are overarching problems which may place intoxicated users in vulnerable situations.

Although a lot of users praised Xanax and Valium for their anxiolytic properties, a few respondents stated they initially took the drugs to ease or eradicate anxious thoughts which then developed into psychological and physical dependency and debilitating withdrawal symptoms such as rebound anxiety and psychotic episodes. Substance misuse charities must be made aware of these effects in order to give the correct advice to users to attend the services.

7.10.5 Message for current users

Users need to be aware of all the adverse negative effects of benzodiazepines, mainly, black-outs and memory loss. Users are advised to stay safe and with friends at all times. Users must be also be

aware that mixing benzodiazepines with other downers like alcohol and ketamine is dangerous and may suppress vital bodily functions like the heartrate and breathing significantly, to such an extent the user stops breathing. Mixing stimulants like MDMA and cocaine with benzodiazepine drugs may cause shock on these vital bodily functions and must also be acknowledged. Other drug interactions are fairly unknown so users are advised to stay cautious. Benzodiazepine users must be aware of the long-lasting side effects and should not drive or partake in other complex psychomotor tasks up at least two days after usage.

Users must be made aware that chemical analysis revealed that Valium drugs were double the strength (sold as 10 mg but some tested were almost 27 mg). Tested Xanax samples revealed they were half the strength (sold as 2 mg but found to be around 1 mg); cut with other substances or none at all. Even though they are classed as prescribed medications, users must be wary that the content of street-bought drugs varies significantly and that dosages should therefore start small. Users are advised to have their drugs tested in order to know the exact safe dosages.

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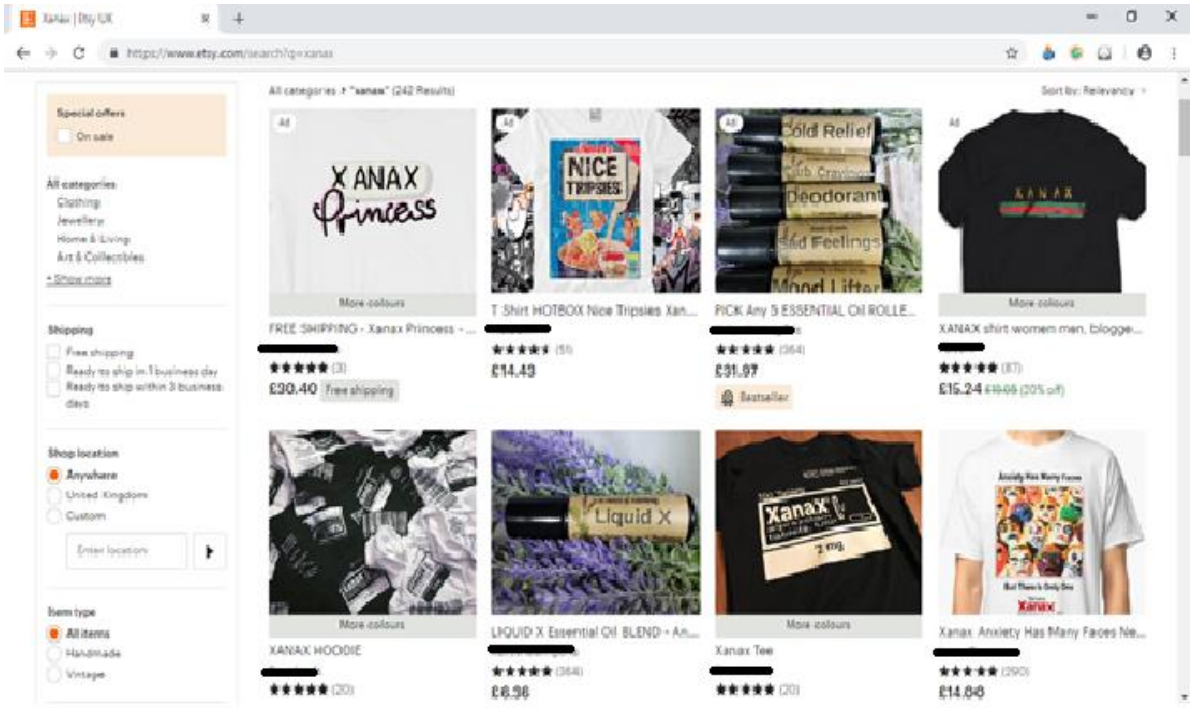
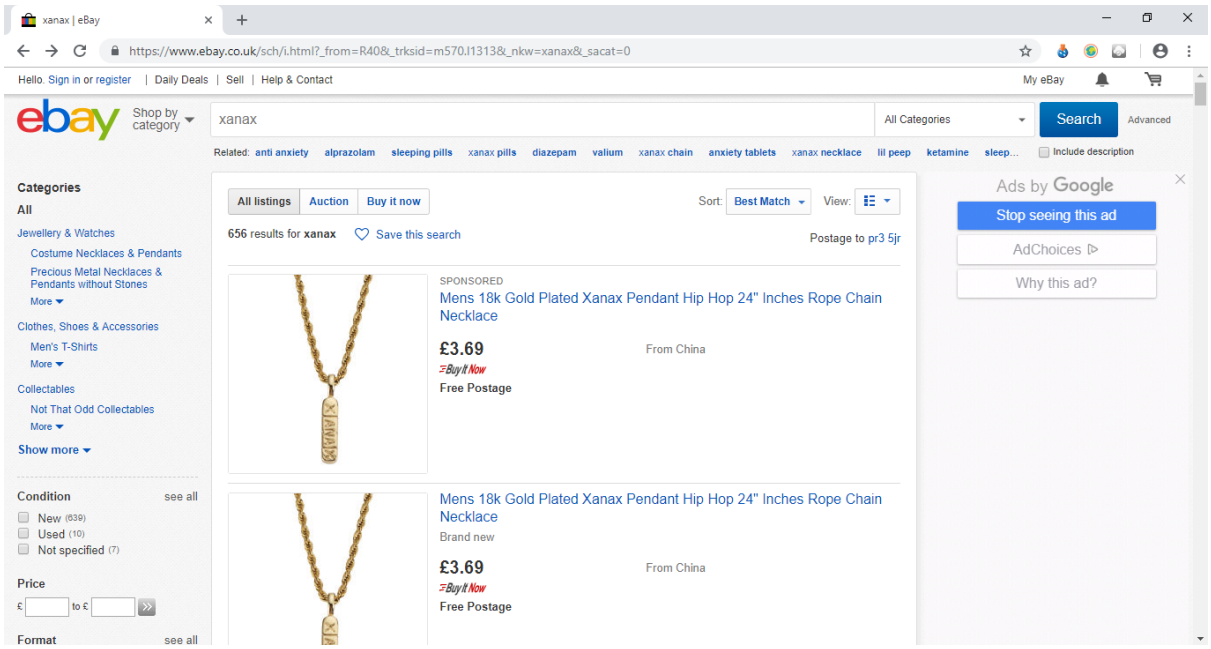
Appendices

Appendix 1: Screenshot of ‘Xanax’ search on Etsy



Appendix 2: Screenshot of ‘Xanax’ search on EBay



Appendix 3: Images of usual Diazepam dosages obtained from https://www.everydayhealth.com

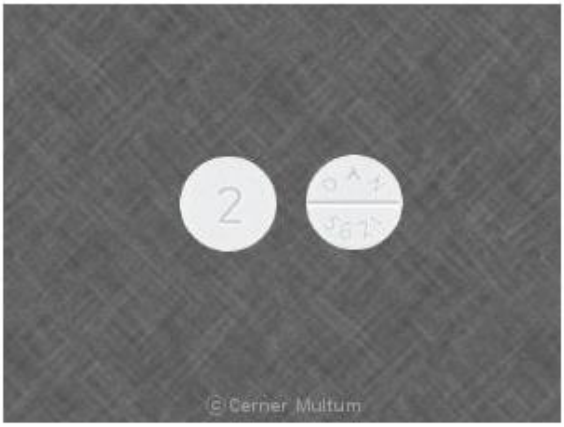
Diazepam 2 mg-MYL, white, round,

Diazepam 2 mg-ESI, white, round,

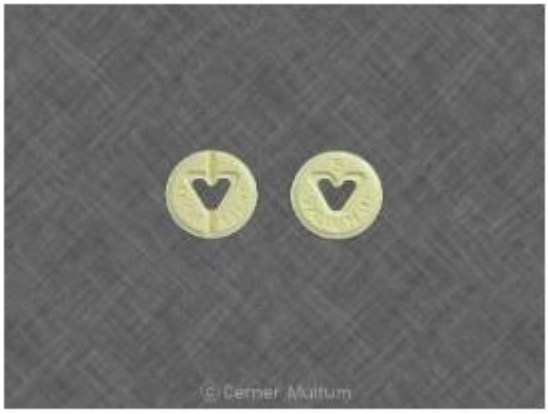
Valium 2 mg, white, round,

Diazepam 2 mg-IVA, white, round,

Diazepam 2 mg-BAR, white, round,



Diazepam 2 mg-WAT, white, round,



Valium 5 mg, yellow, round,

Diazepam 5 mg-BAR, yellow, round,

Diazepam 5 mg-IVA, yellow, round,

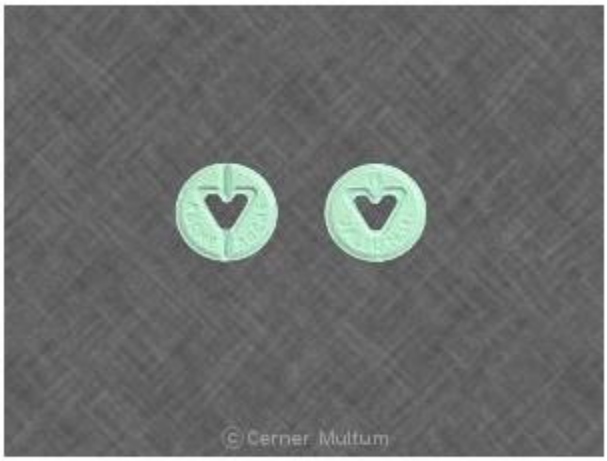
Diazepam 5 mg-SCH, yellow, round,

Diazepam 5 mg-WAT, yellow, round,

Diazepam 5 mg-MYL, orange, round,

Diazepam 10 mg-BAR, blue, round,

Diazepam 10 mg-MYL, green, round,



Valium 10 mg, blue, round,

Diazepam 10 mg-IVA, blue, round,

Diazepam 10 mg-WAT, blue, round,

Appendix 4: Images of usual Alprazolam dosages obtained from https://www.everydayhealth.com

Alprazolam 0.25 mg-MYL, white, round,

Alprazolam 0.25 mg-ACT, white, round,

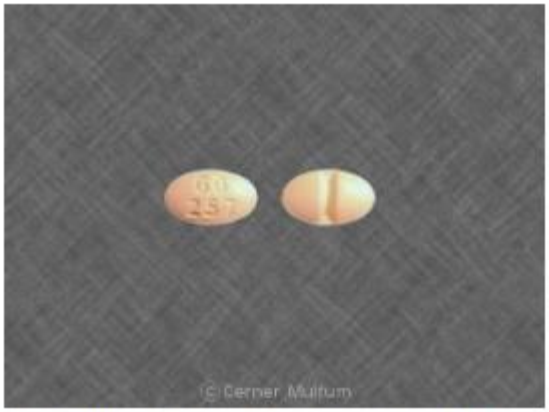
Alprazolam 0.25 mg-GG, white, oval,

Alprazolam 0.25 mg-MAJ, white, round,

Alprazolam 0.25 mg-GRE, white, oval,

Xanax 0.25 mg, white, oval,

Xanax 0.5 mg, orange, oval,

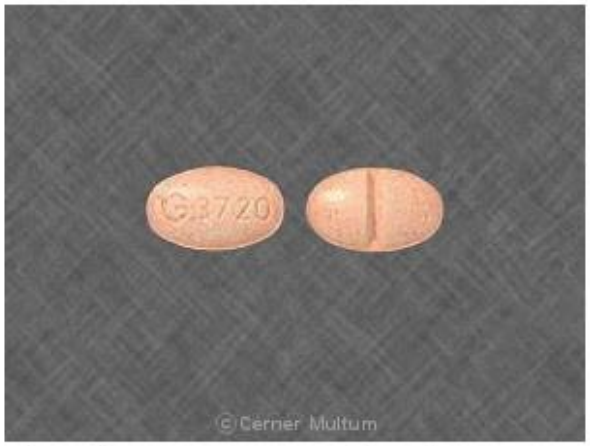


Alprazolam 0.5 mg-GG, orange, oval,

Alprazolam 0.5 mg-MAJ, peach, round,

Alprazolam 0.5 mg-PP, peach, round,

Alprazolam 0.5 mg-MYL, peach, round,



Alprazolam 0.5 mg-GS, peach, oval,

Alprazolam 0.5 mg-PP, peach, round,

Alprazolam 1 mg-GRE, blue, oval,

Alprazolam 1 mg-GG, blue, elliptical,

Alprazolam 1 mg-ACT, blue, round,

Alprazolam 1 mg-MYL, blue, round,

Xanax 1 mg, blue, oval,

Alprazolam 2 mg-GG, white, rectangular,

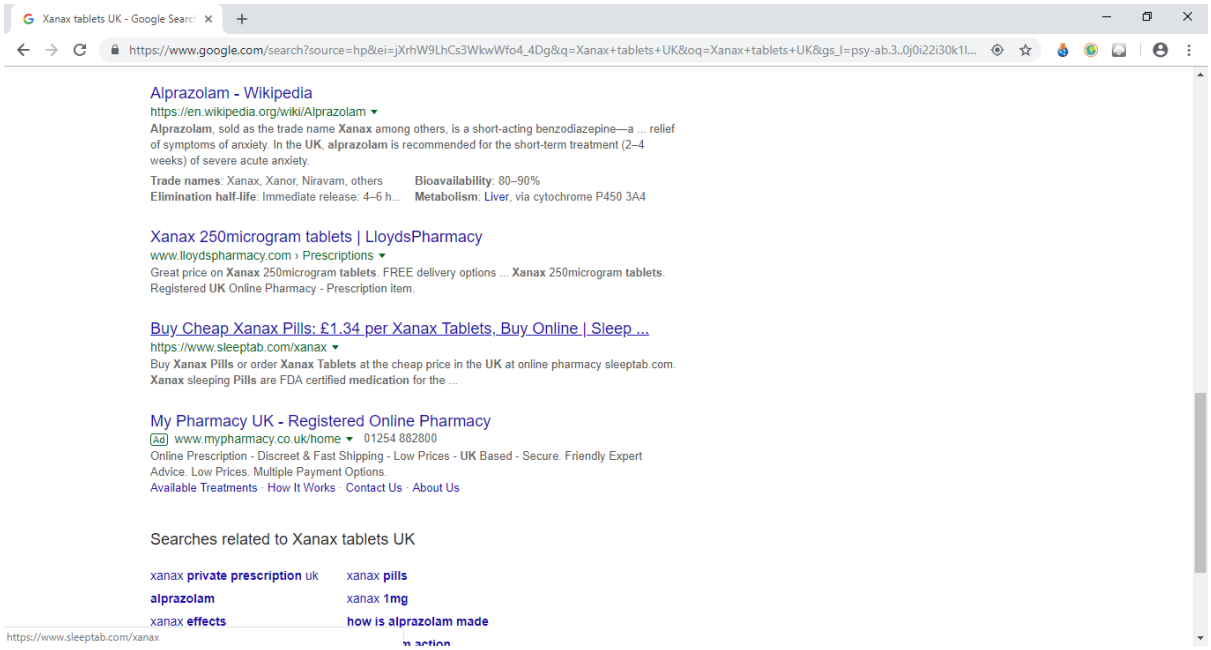
Alprazolam 2 mg-MYL, white, round,

Xanax 2 mg, white, rectangular, film coated

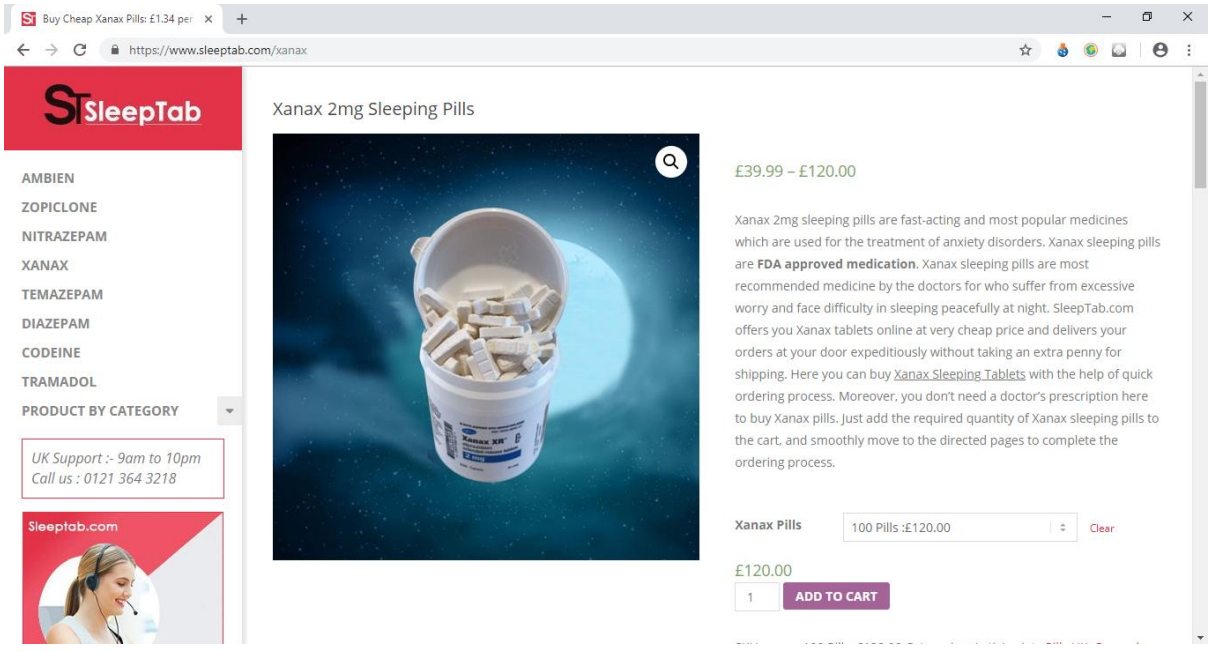
Alprazolam 2 mg-PP, yellow, rectangular,

Alprazolam 2 mg-GS, white, rectangular,

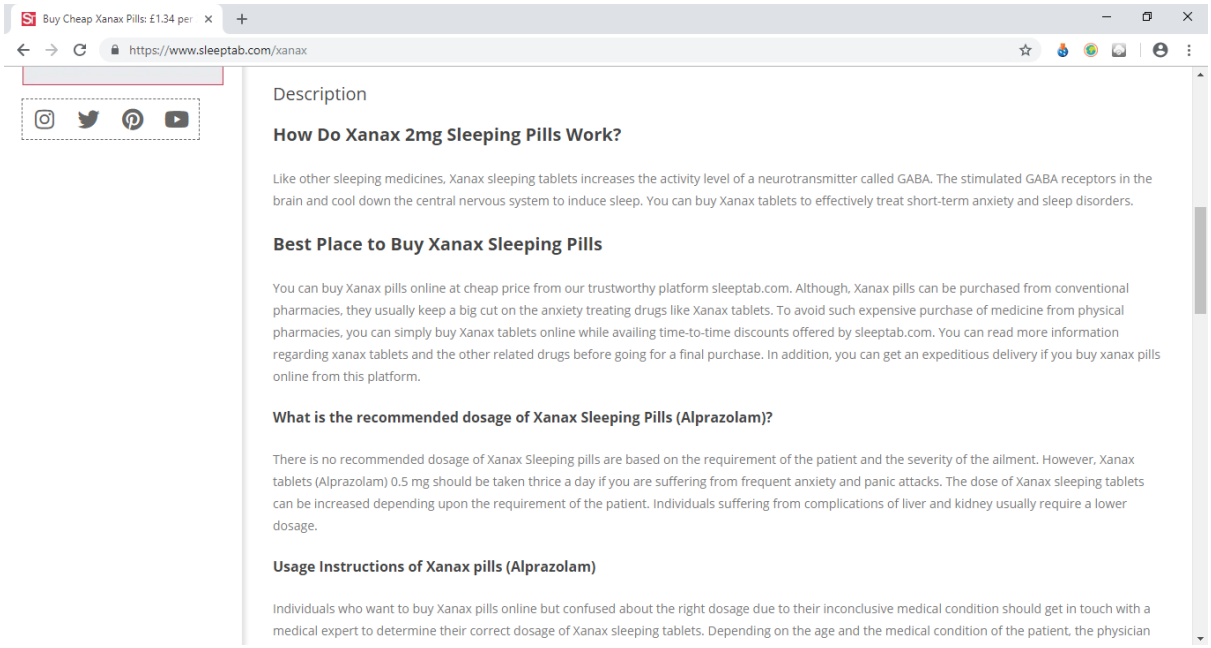
Appendix 5: ‘Xanax’ search on google



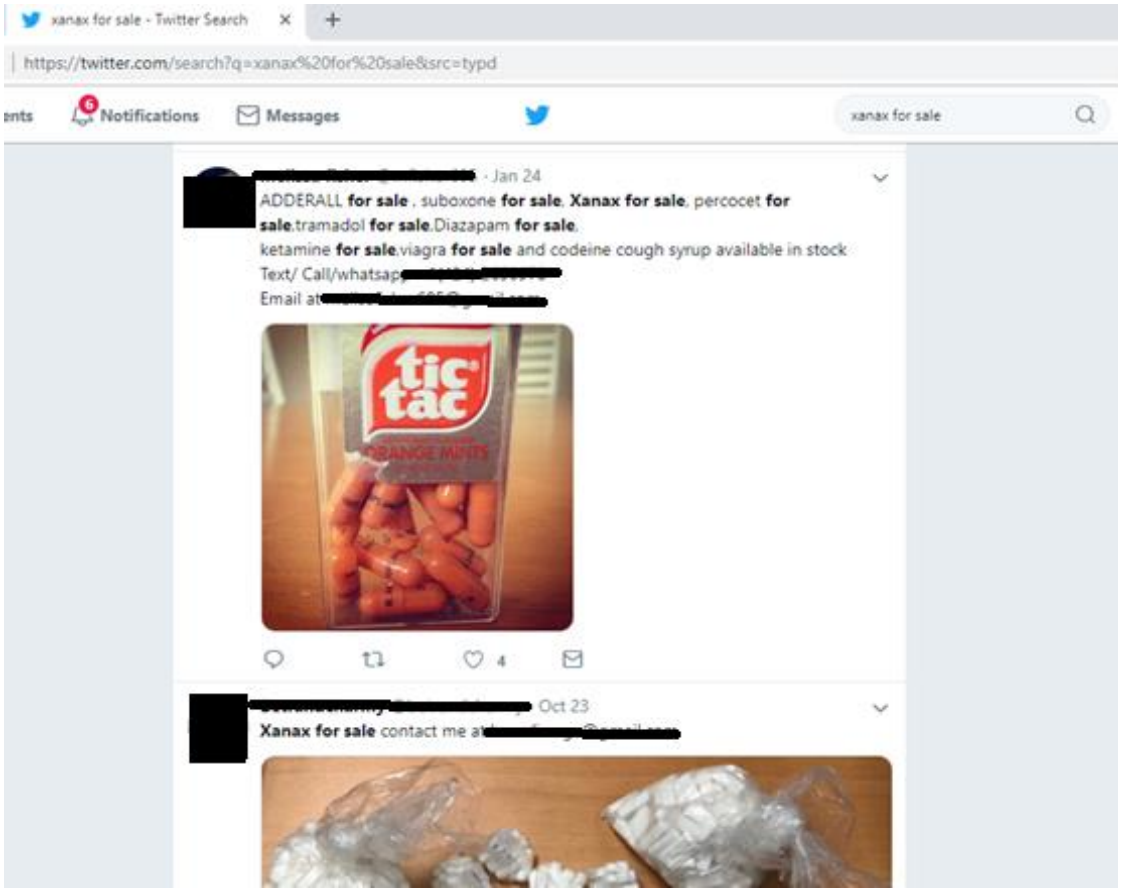
Appendix 6: Sleep tab website: benzodiazepine sales and information about Xanax



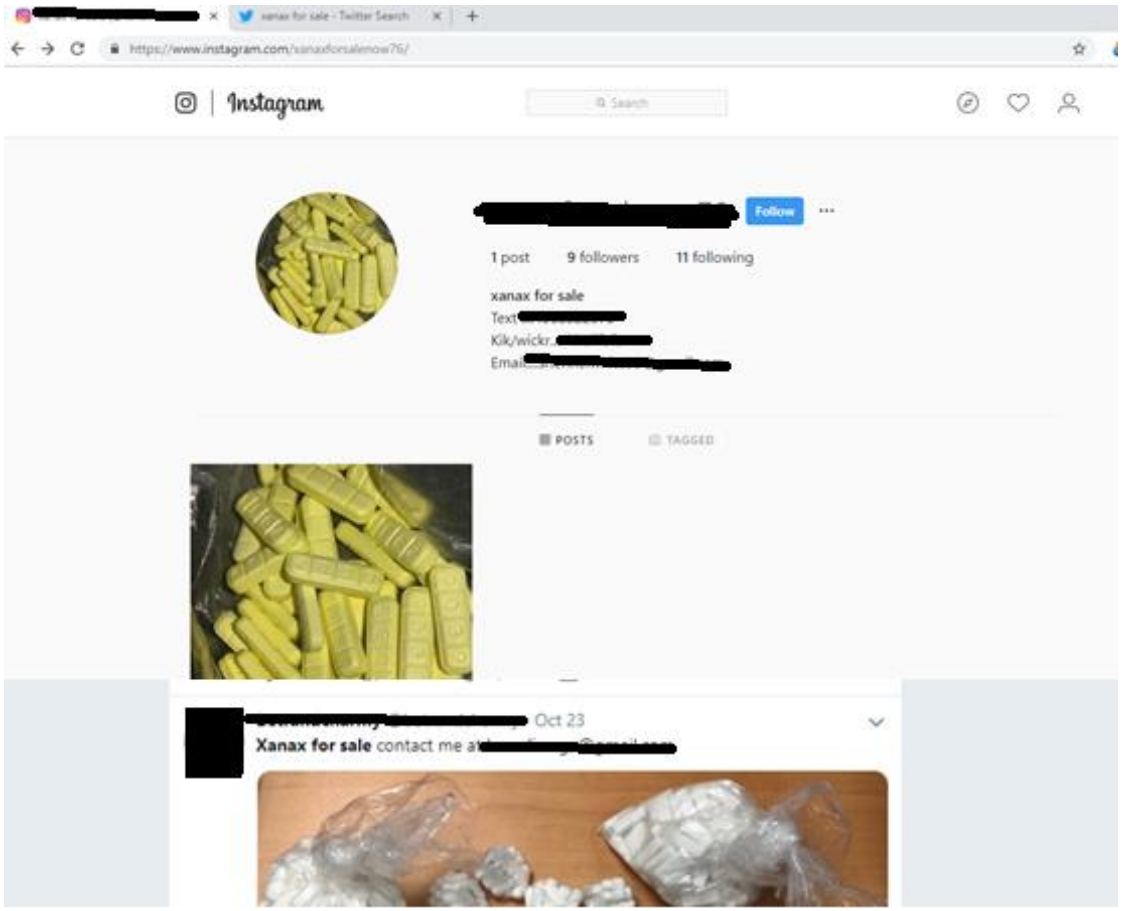
Appendix 7: Sleep tab website: benzodiazepine variety and information about Xanax



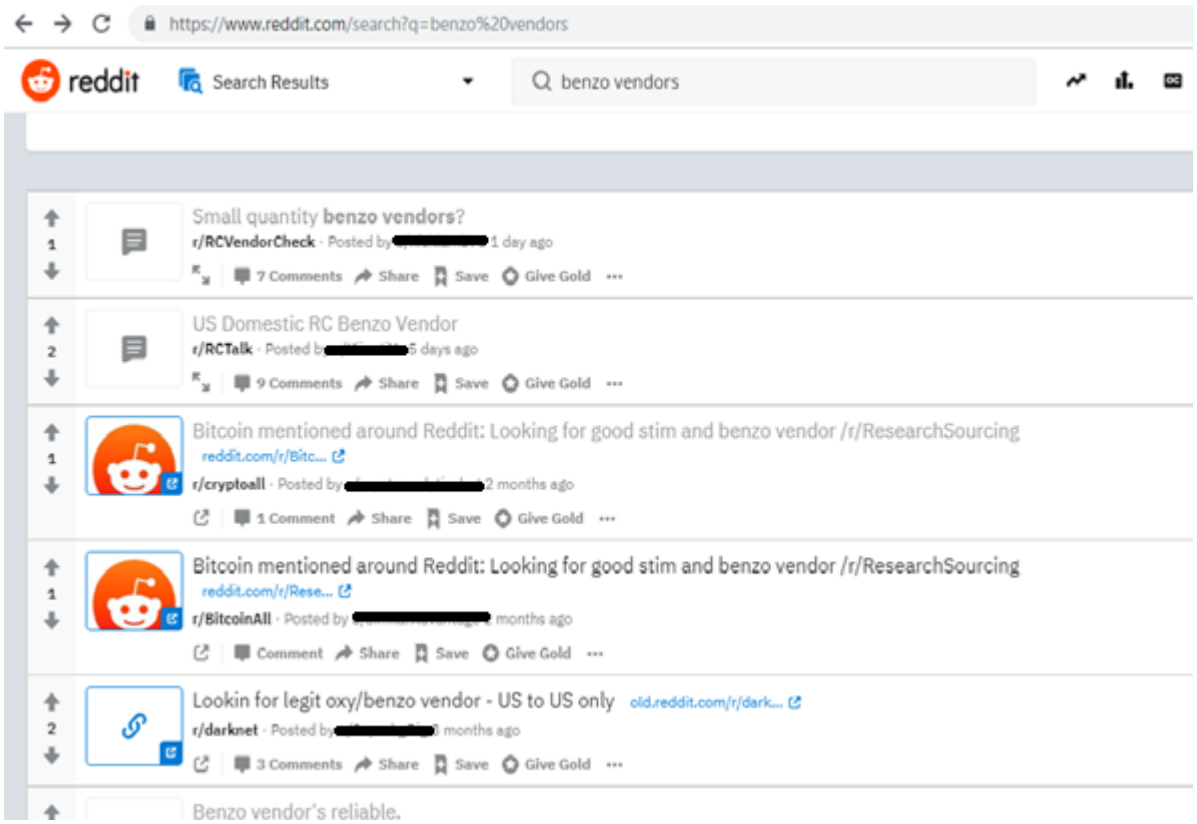
Appendix 8: Screenshot of Twitter search: 'Xanax for sale'



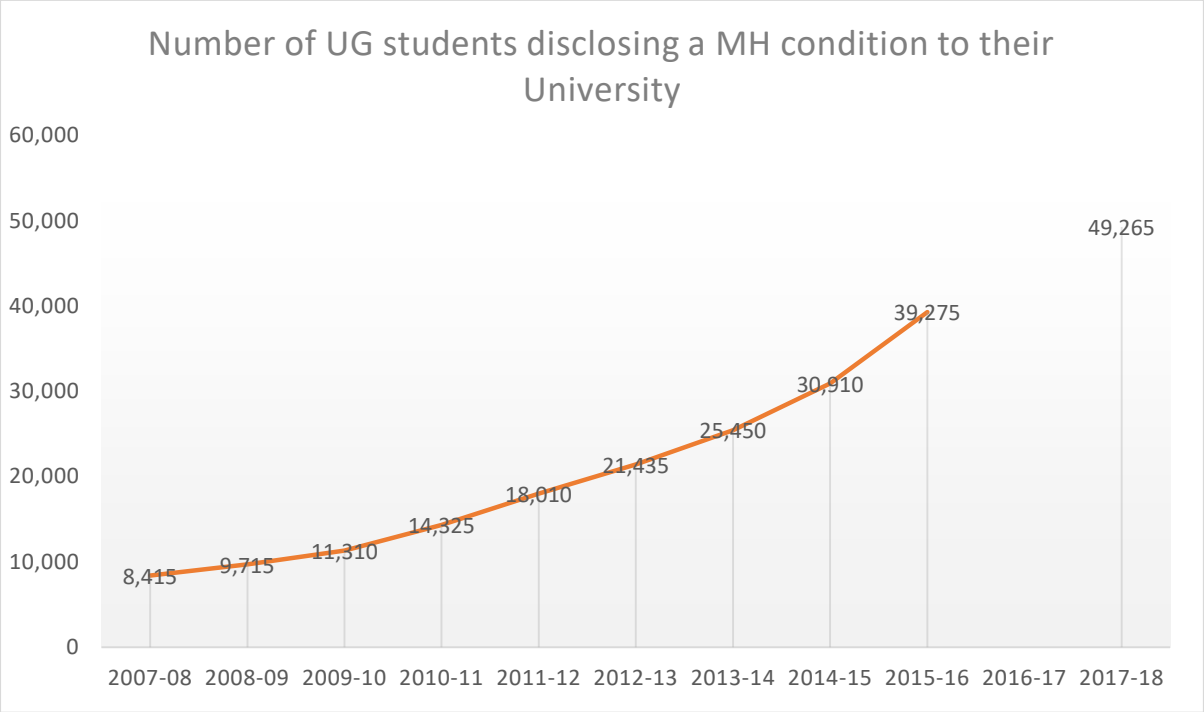
Appendix 9: Screenshot of Xanax *Instagram* dealer



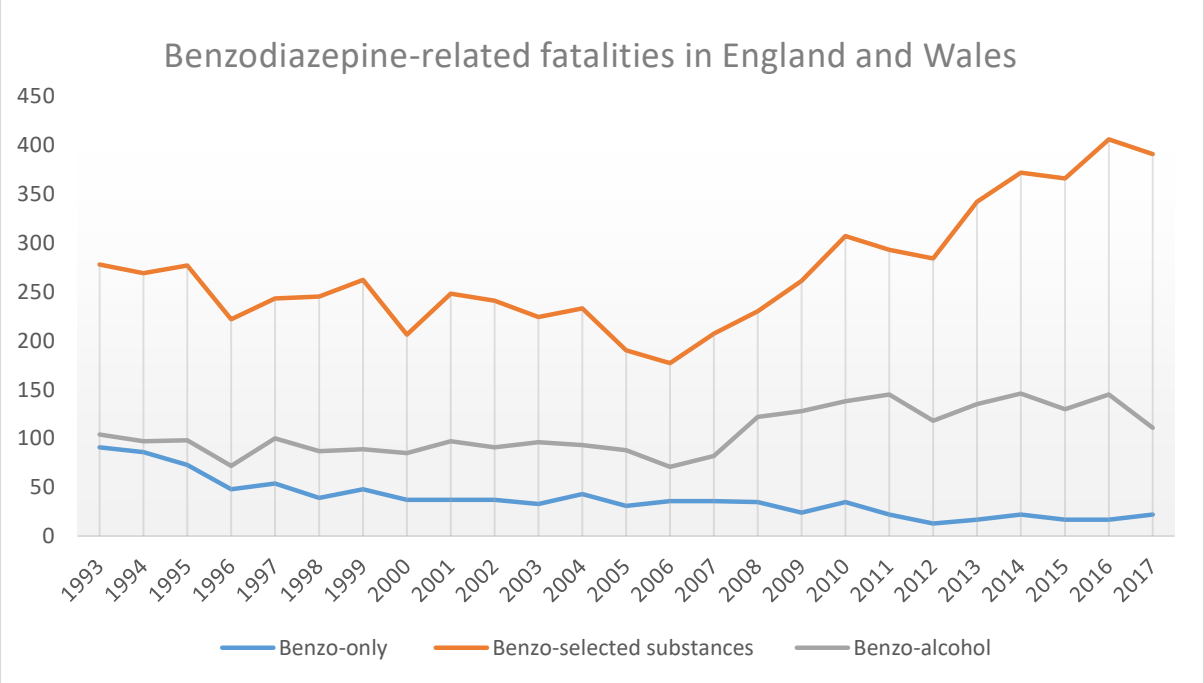
Appendix 10: Screenshot of benzodiazepine discussions on *Reddit*



Appendix 11: Number of undergraduate students disclosing a mental health condition to their University



Appendix 12: Benzodiazepine-related fatalities in England and Wales



Appendix 13: Full copy of the online survey

Start of Block: Demographics

Q1 Age

- 18-21 (1)
- 22-25 (2)
- 26-30 (3)
- 31-40 (4)
- 41+ (5)

Q2 Sex

- Male (1)
- Female (2)
- Other (please state) (3) _____

Q3 Sexuality

- Heterosexual/ straight (1)
- Homosexual/ gay/ lesbian (2)
- Bisexual (3)
- A sexual (4)
- I'd rather not say (5)
- Other (6)

Q4 Ethnicity

- White (1)
- Black (2)
- Asian (3)
- Mixed (4)
- Chinese (5)
- Click to write Choice 7 (6)
- Other (please state) (7) _____

Q5 Current home

- South East (Brighton, Canterbury) (1)
- London (2)
- North West (Manchester, Preston, Liverpool, Burnley, Bolton) (3)
- East of England (Cambridge, Norwich, Peterborough) (4)
- West Midlands (Birmingham, Wolverhampton, Coventry) (5)
- South West (Exeter, Falmouth, Newquay) (6)
- Yorkshire and the Humber (Leeds, Sheffield, York, Hull) (7)
- East Midlands (Nottingham, Loughborough, Leicester) (8)
- North East (Newcastle, Durham) (9)
- I'd rather not say (10)
- Outside of England (please state) (11) _____

Q6 What is your occupation?

- Full/ part-time student (1)
- Employed (paid work) (2)

- Employed (voluntary work) (3)
- Self-employed (4)
- A homemaker (5)
- Unable to work (6)
- Other (please state) (7) _____

End of Block: Demographics

Start of Block: Which BZDs

Q7 Which benzo(s) have you taken? (You may chose multiple answers)

- Valium (Diazepam) (1)
- Xanax (Alprazolam) (2)
- Ativan (Lorazepam) (3)
- Klonopin (Clonazepam) (4)
- Tranxene (Clorazepate) (5)
- Librium (Chlordiazepoxide) (6)
- Estazolam (7)
- Other (please state) (8) _____

Q8 Which BZDs have you used in the last 2 months? (You may chose multiple answers)

- Valium (Diazepam) (1)
- Xanax (Alprazolam) (2)
- Ativan (Lorazepam) (3)
- Klonopin (Clonazepam) (4)
- Tranxene (Clorazepate) (5)
- Librium (Chlordiazepoxide) (6)
- Estazolam (7)
- Other (please state) (8) _____
- I haven't used them recently (9)

Q9 What is your preferred benzo?

- Valium (Diazepam) (1)
- Xanax (Alprazolam) (2)
- Ativan (Lorazepam) (3)
- Klonopin (Clonazepam) (4)
- Tranxene (Clorazepate) (5)
- Librium (Chlordiazepoxide) (6)
- Estazolam (7)
- Other (please state) (8) _____

Q10 Why is this your benzo of choice?

_____
_____
_____
_____
_____

End of Block: Which BZDs

Start of Block: Why, how, when, where

Q11 What is your reason for taking them? (You may chose multiple answers)

- For anxiety or similar issues - prescribed (1)
- For anxiety or similar issues - non-prescribed (2)
- To get to sleep (3)
- To get high (4)
- To counteract the effect of stimulants (i.e. MDMA or Cocaine) (5)
- Other (please state) (6) _____

Q12 On average, how often do you take them?

- More than once a day (1)
- Every day (2)
- Every other day (3)
- 1-2 times a week (4)
- Once a fornight (5)
- Once a month (6)
- Every few months (7)
- Other (please state) (8) _____

Q13 How many do you generally take on each occasion?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6-10 (6)	Over 10 (7)
Valium (1)	•	•	•	•	•	•	•
Xanax (2)	•	•	•	•	•	•	•
Ativan (3)	•	•	•	•	•	•	•
Klonopin (4)	•	•	•	•	•	•	•
Tranxene (5)	•	•	•	•	•	•	•
Librium (6)	•	•	•	•	•	•	•
Estazolam (7)	•	•	•	•	•	•	•
Other (please state) (8)	•	•	•	•	•	•	•

Q14 Please comment with the type of benzo you'd take, which milligram/ microgram dosage you would normally take and why(i.e. 1x5mg Valium to calm my nerves before public speaking OR 3x2mg Xanax after a night out on MDMA)

_____
_____
_____
_____
_____

Q15 How do you take your benzos? (You may choose multiple answers)

- Swallow it (1)
- Snort it (2)
- Inject it (3)
- Any additional comments: (4)

_____

Q16 Please briefly describe a memorable encounter involving benzos. In what context did you take them? What effects did you feel?
(Which, when, where, why, how many & at what dosage)
For example: Took 4 Valium and passed out on a long bus journey

_____
_____
_____
_____
_____

End of Block: Why, how, when, where

Start of Block: Other substance usage

Q17 Which other substances have you tried? (You may choose multiple answers)

- Alcohol (1)
- Tobacco (2)
- Cannabis (3)
- MDMA - crystal/ powder form (4)
- MDMA - pill form (5)
- Cocaine (6)
- Ketamine (7)
- LSD/ Acid (8)
- Magic Mushrooms (9)
- Amphetamines (speed) (10)
- Modafinil/ Ritalin (11)
- Heroin (12)
- Crack Cocaine (13)
- Other (please state) (14) _____
- None of the above (15)

Q18 What do you consume before/ alongside/ after taking benzos (within the hour)? (You may choose multiple answers)

- Nothing (1)
- Alcohol (2)
- Tobacco (3)
- Cannabis (4)
- MDMA - crystal/ powder form (5)
- MDMA - pill form (6)
- Cocaine (7)
- Ketamine (8)
- LSD/ Acid (9)
- Magic Mushrooms (10)
- Amphetamines (speed) (11)

- Modafinil/ Ritalin (12)
- Heroin (13)
- Crack Cocaine (14)
- Other (please state) (15) _____
- Any additional comments: (16)

_____
_____ _____

End of Block: Other substance usage

Start of Block: Supply

Q19 Where do you get your benzodiazepines?

- Through the NHS - prescribed (1)
- Through the NHS - non-prescribed (2)
- Through a friend (3)
- Through a family member (4)
- From a work or study colleague (5)
- Online - clearweb (6)
- Online - darkweb (7)
- Dealer (8)
- Other (please state) (9) _____

Q20 If you chose dealer, is it the same person who deals you... (You may choose multiple answers)

- N/A (1)
- Only benzos (2)
- Cannabis (3)
- MDMA - crystal/ powder form (4)
- MDMA - pill form (5)
- Cocaine (6)
- Ketamine (7)
- LSD/ Acid (8)
- Magic Mushrooms (9)
- Amphetamines (speed) (10)
- Modafinil/ Ritalin (11)
- Heroin (12)
- Crack Cocaine (13)
- Other (please state) (14) _____

Q21a If you pay for your benzos, how much (on average) do you pay PER tablet or bar?

	I do not pay for them (1)	50p (2)	£1 (3)	£1.50 (4)	£2 (5)	£3 (6)	£4 (7)	Other (8)
Valium (1)	•	•	•	•	•	•	•	•
Xanax (2)	•	•	•	•	•	•	•	•
Ativan (3)	•	•	•	•	•	•	•	•
Klonopin (4)	•	•	•	•	•	•	•	•

Tranxene (5)	•	•	•	•	•	•	•	•
Librium (6)	•	•	•	•	•	•	•	•
Estazolam (7)	•	•	•	•	•	•	•	•
Other (please state) (8)	•	•	•	•	•	•	•	•

Q21b Any additional comments to add to the previous question

_____
_____
_____
_____
_____

Q22 How many do you generally purchase at a time?

- N/A (1)
- 1-5 (2)
- 6-10 (3)
- 11-20 (4)
- 21-30 (5)
- 31-50 (6)
- 51-100 (7)
- Over 100 (8)

End of Block: Supply

Start of Block: Substance replacement

Q23 Why do you chose benzodiazepine(s) as opposed to any other similar substance (a sedative/ something which will calm the mind and body i.e. weed)? (You may choose multiple answers)

- It is a prescribed drug (1)
- They are the only drug I have tried which will calm me down (2)
- It has the best desired effect (3)
- They are cheap (4)
- They are easily accessible (5)
- They are easy to hide (6)
- They are easy to consume (7)
- Other (please state) (8)

_____
_____ _____
____ _____ _____
_____ _____

End of Block: Substance replacement

Appendix 14: Ethical Approval for research project

Manchester Metropolitan
University

Faculty of Arts and Humanities
Research and Knowledge Exchange

Manchester Metropolitan University, Room 123,
Geoffrey Manton Building,
Rosamund Street West,
Off Oxford Road,
Manchester, M15 6LL, UK

+44 (0)161 247 6673

Name Harriet Bloomfield
Department Sociology

28 February 2018

Dear Harriet,

Application for Ethical Approval

Name: Harriet Bloomfield

Project Title: Qualitative and Quantitative Analysis of Diverted and/ or Illicitly Supplied Medications within the Recreational Market

Ethics Reference Number: A&H1718-32

I am pleased to inform you that the above Ethical Application has been approved unconditionally.

I would be grateful if you could inform the other member(s) of the supervisory team.

Yours sincerely

Katherine Walthall
Research Group Officer

Tel: +44 (0)161 247 6673
Email: k.walthall@mmu.ac.uk

cc. Rob Ralphs

Appendix 15: Participant information sheet for survey participants

I am carrying out research regarding the medical and non-medical use of benzodiazepines such as Diazepam (trade name Valium) and Alprazolam (trade name Xanax). Participants are required to have personal experience of benzodiazepine usage.

Background

Benzodiazepines are classed as hypnotic and anxiolytic drugs which are traditionally prescribed to treat insomnia and assist in the management of mental health issues such as anxiety and panic disorder. Alongside medicinal usage, benzodiazepines are also used for recreational purposes and to self-medicate.

There is little knowledge regarding the supply of the diverted and illicitly supplied medicines, however concerns of casualties and at worst death are a result of misuse, poly-drug use and the consumption of counterfeit tablets, which is spreading rapidly in countries such as Scotland and the US.

What is the purpose of this research?

There is little information surrounding the prevalence and nature of benzodiazepine usage within the UK. This research wishes to explore:

- Which types of benzos people are taking
- Why people are taking them
- How many they are taking and at what dosage
- The context in which they are being taken
- The market of illicitly supplied pharmaceuticals

This quantitative survey will be complimented with in-depth one-to-one interviews and chemical analyses of seized street samples.

What will happen with the results of this study?

The findings will be used: to gain a clearer understanding of the prevalence and nature of benzodiazepine usage; to build an understanding of the supply of benzodiazepines; to inform users about the harms of recreational benzodiazepine usage; to make individuals aware of counterfeit samples and; inform individuals about the dangers surrounding poly drug use.

Why do you want me to take part?

As an individual with direct experience of benzodiazepine usage, it is hoped that you will provide insight into: the extent of benzodiazepine usage (medicinal and non-medicinal) and the reasons behind consumption.

What will it involve?

You will be asked to complete a web-based survey which is estimated to take around 10-15 minutes. You may also wish to agree to a follow-up face-to-face interview which will allow the researcher to gather a more in-depth and detailed responses to broaden the pool of research.

Confidentiality

All the responses you provide during the full course of this research will maintain strictly confidential. You will not be identifiable in any publications. Should you wish to participate in the follow-up study, your anonymity will be preserved and full consent forms will be issued. Throughout this research, ethical guidelines are adopted from the Social Research Association (2003).

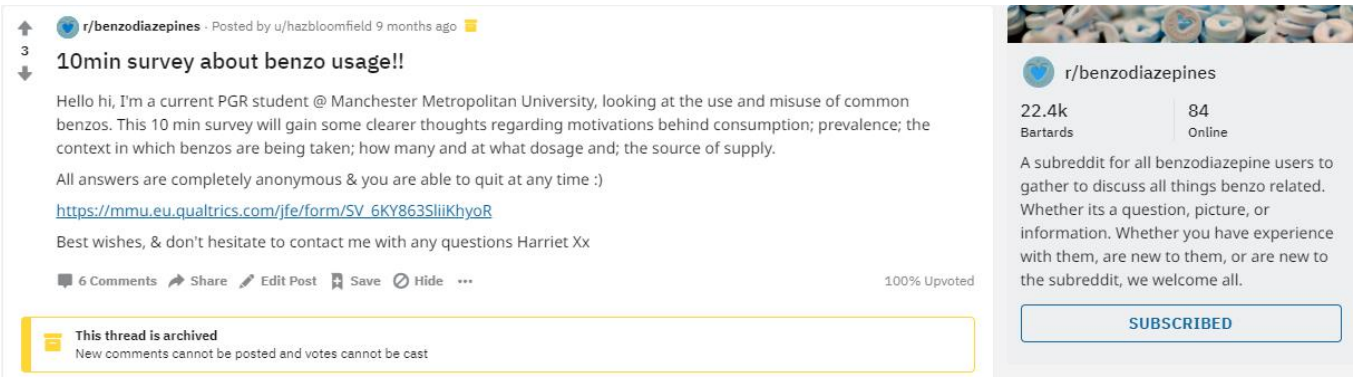
Contact details

Head researcher: Harriet Bloomfield, Masters by Research student at Manchester Metropolitan University, M15 6LL. Email: harriet.bloomfield@stu.mmu.ac.uk

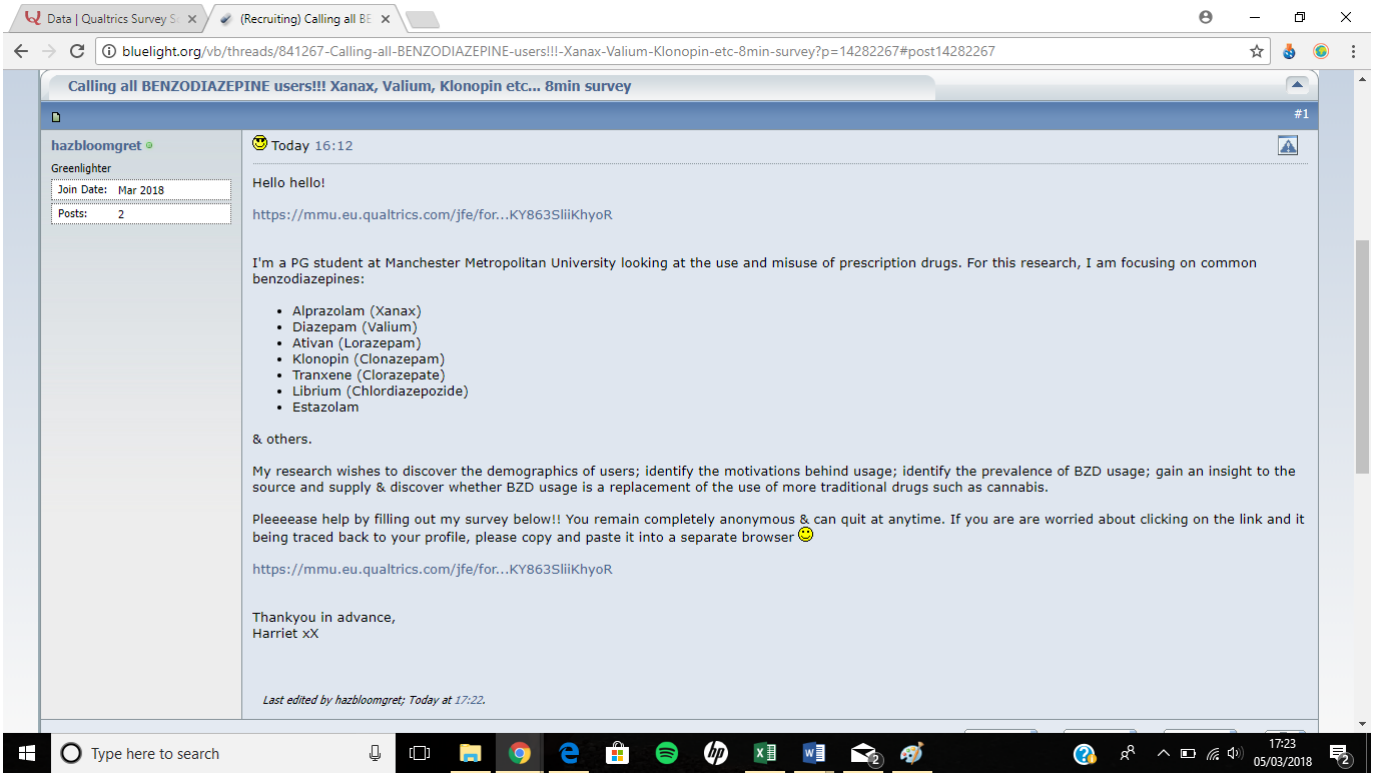
Research supervisor: Dr Rob Ralphs, supervisor and reader in Criminology at Manchester Metropolitan University, M15 6LL. Email: R.Ralphs@mmu.ac.uk. Tel: 0161 247 3014

Thank you for participating!

Appendix 16: Screenshot of *Reddit* post



Appendix 17: Screenshot of *Bluelight* post



Appendix 18: *Facebook* pages and their geographical location

Personal Facebook page – https://www.facebook.com/harrietbloomfield

Facebook Marketplace - https://www.facebook.com/marketplace/110336295660526/

East Midlands (Nottingham, Loughborough, Leicester, Lincoln)

Closed Facebook group – Buy/Sell Tickets (Notts uni) – UniSalad –
https://www.facebook.com/groups/352110954925626/

Closed Facebook group – Overheard at Trent.
– https://www.facebook.com/groups/1589775194583920/

Closed Facebook group – Overheard at Leicester
– https://www.facebook.com/groups/1395453730700118/

Closed Facebook group – Overheard at Lincoln
– https://www.facebook.com/groups/1571879906359544/

East of England (Cambridge, Norwich, Peterborough, Essex)

Closed Facebook group – Overheard at Colchester Sixth Form
– https://www.facebook.com/groups/187934794639632/?ref=br_rs

London

Public Facebook group – Official UAL Freshers' 2017-18
– https://www.facebook.com/groups/1438388166180000/about/

Closed Facebook group – Overheard at Imperial
– https://www.facebook.com/groups/646648388729305/

Closed Facebook group – Overheard at Kings.
– https://www.facebook.com/groups/1453411631548774/

Closed Facebook group – Overheard at Queen Mary
– https://www.facebook.com/groups/705067822861454/

Closed Facebook group – Overheard at Central St Martins
– https://www.facebook.com/groups/1456038254617516/

North East (Newcastle, Durham)

Closed Facebook group – Overheard at
Durham Uni – https://www.facebook.com/groups/99499879280/

Closed Facebook group – Overheard at Newcastle

– https://www.facebook.com/groups/584319688315165/

Closed Facebook group – Overheard at Northumbria

– https://www.facebook.com/groups/577299895688491/

North West (Manchester, Salford, Liverpool)

Closed Facebook group – Fallowfield Students Group (FSG)

– https://www.facebook.com/groups/Fallowfieldbuynselltickets/

Public Facebook group – Manchester Uni & Manchester Met Freshers 2017-2018

– https://www.facebook.com/groups/938866779473395/

Closed Facebook group – Overheard at Manchester Metropolitan

– https://www.facebook.com/groups/342914559180413/

Closed Facebook group – Fallowfield Buy / Sell tickets 2017/18

– https://www.facebook.com/groups/1244490875607605/

Closed Facebook group – WHP/Parklife Tickets

– https://www.facebook.com/groups/1482100905181541/?ref=br_rs

Closed Facebook group – Overheard at Manchester

– https://www.facebook.com/groups/528931703885381/

Closed Facebook group – Overheard at Salford

– https://www.facebook.com/groups/467400876768896/

Closed Facebook group – Overheard at Liverpool

– https://www.facebook.com/groups/589856854403117/

Closed Facebook group – Overheard at Liverpool hope.

– https://www.facebook.com/groups/579754708776047/about/

Closed Facebook group – Overheard

at John Moores – https://www.facebook.com/groups/574035859331989/

Public Facebook group – Overheard at Lancaster

– https://www.facebook.com/groups/overheard.at.lancaster/?fref=nf

South East (Brighton, Canterbury, Portsmouth, Southampton)

Closed Facebook group – Overheard at Portsmouth

– https://www.facebook.com/groups/188927307973292/

South West (Bristol, Bath, Exeter, Falmouth, Newquay, Bournemouth)

Closed Facebook group – Overheard at Bournemouth!

– https://www.facebook.com/groups/1434396380123502/

Closed Facebook group – Overheard at Bristol.

– https://www.facebook.com/groups/745593605504743/

Closed Facebook group – Overheard at UWE

– https://www.facebook.com/groups/976667319028790/

Closed Facebook group – Official UWE Freshers 2017 – University of the West of England Bristol.

– https://www.facebook.com/groups/UWEBristolFreshers2017/

Public Facebook group – Clifton and Stoke Bishop Tickets.

– https://www.facebook.com/groups/632857390090581/about/

Closed Facebook group – Overheard at Bath

– https://www.facebook.com/groups/475984969255191/

West Midlands (Birmingham, Coventry)

Closed Facebook group – Overheard at Birmingham

– https://www.facebook.com/groups/430446117114537/

Closed Facebook group – Overheard at Coventry

– https://www.facebook.com/groups/1507028259568885/

Yorkshire and the Humber (Leeds, Sheffield, York, Hull)

Closed Facebook group – Overheard at Leeds.

– https://www.facebook.com/groups/721002447924770/

Public Facebook group – Leeds Uni Tickets

– https://www.facebook.com/groups/117100318646642/

Closed Facebook group – Overheard at Beckett

– https://www.facebook.com/groups/1432905533608253/

Closed Facebook group – Overheard at Sheffield.

– https://www.facebook.com/groups/743908699022155/

Closed Facebook group – Overheard at Hallam

– https://www.facebook.com/groups/564632107000144/about/

Closed Facebook group – Overheard at Hull

– https://www.facebook.com/groups/890616594291763/

Wales

Rejected access

Scotland

Public Facebook group – Edinburgh Ticket Exchange

- https://www.facebook.com/groups/166610787148289/about/

Closed Facebook group – Overheard at Heriot-Watt. -

https://www.facebook.com/groups/1541428172799204/

Appendix 19: *Facebook* post no.1: Thursday 01/03/2018

Personal Facebook page – https://www.facebook.com/harrietbloomfield

Closed Facebook group – Fallowfield Students Group (FSG) – https://www.facebook.com/groups/Fallowfieldbuynselltickets/

Facebook Marketplace - https://www.facebook.com/marketplace/110336295660526/

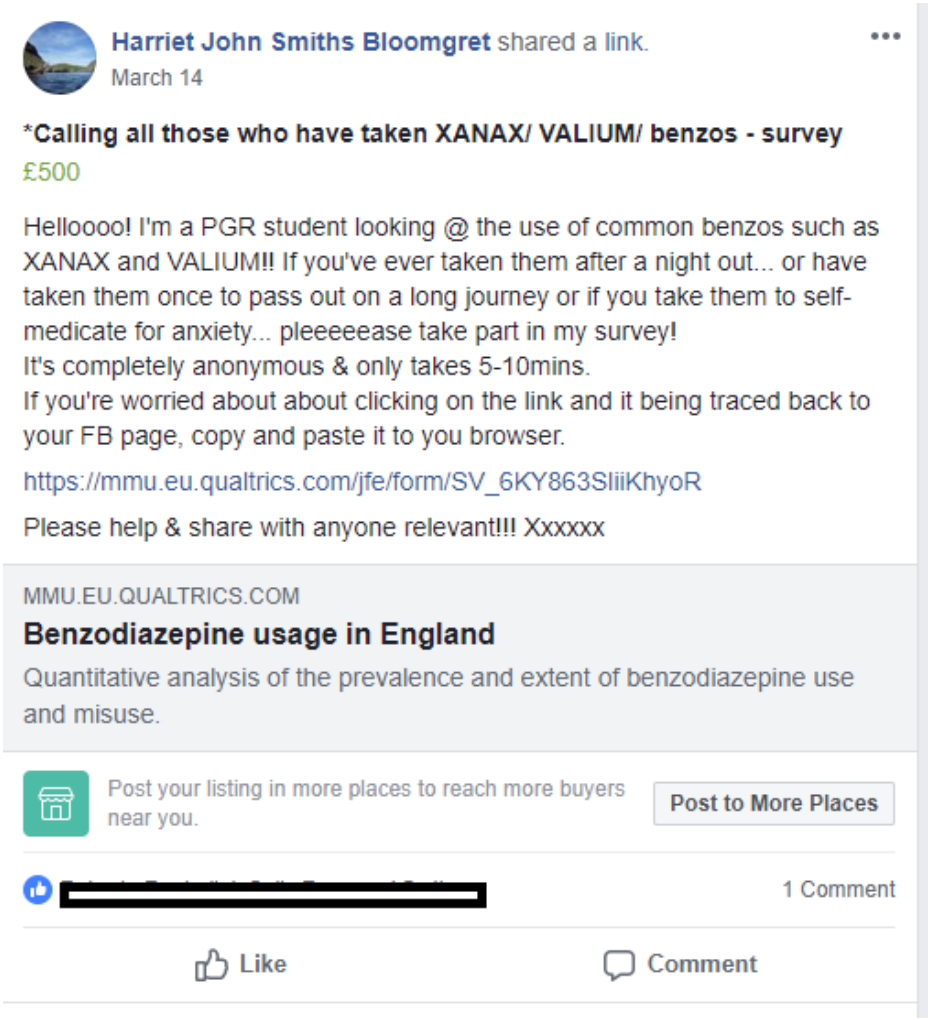
Closed Facebook group – Fallowfield Buy / Sell tickets 2017/18 – https://www.facebook.com/groups/1244490875607605/

Public Facebook group – Manchester Uni & Manchester Met Freshers 2017-2018 – https://www.facebook.com/groups/938866779473395/

Closed Facebook group – WHP/Parklife Tickets – https://www.facebook.com/groups/1482100905181541/?ref=br_rs

Total posts = 6

Appendix 20: *Facebook* post no.2: Wednesday 14/03/2018 at 18.30 – 19.00



Closed Facebook group – Buy/Sell Tickets (Notts uni) – https://www.facebook.com/groups/352110954925626/

Closed Facebook group – Fallowfield Buy / Sell tickets 2017/18 – https://www.facebook.com/groups/1244490875607605/

Public Facebook group – Manchester Uni & Manchester Met Freshers 2017-2018 – https://www.facebook.com/groups/938866779473395/

Closed Facebook group – Fallowfield Students Group (FSG) – https://www.facebook.com/groups/Fallowfieldbuynselltickets/

Public Facebook group – Official UAL Freshers' 2017-18 – https://www.facebook.com/groups/1438388166180000/about/

Total posts = 5

Appendix 21: *Facebook* post no.3: Monday 26/03/2018 at 19.00 – 21.00 hours

Personal Facebook page – https://www.facebook.com/harrietbloomfield

Public Facebook group – Leeds Uni Tickets – https://www.facebook.com/groups/117100318646642/

Facebook Marketplace - https://www.facebook.com/marketplace/110336295660526/

Closed Facebook group – Fallowfield Students Group (FSG) – https://www.facebook.com/groups/Fallowfieldbuynselltickets/

Public Facebook group – Manchester Uni & Manchester Met Freshers 2017-2018 – https://www.facebook.com/groups/938866779473395/

Closed Facebook group – WHP/Parklife Tickets – https://www.facebook.com/groups/1482100905181541/?ref=br_rs

Closed Facebook group – Fallowfield Buy / Sell tickets 2017/18 – https://www.facebook.com/groups/1244490875607605/

Public Facebook group – Edinburgh Ticket Exchange –
https://www.facebook.com/groups/166610787148289/about/

Closed Facebook group – Overheard at Durham Uni –
https://www.facebook.com/groups/99499879280/

Closed Facebook group – Overheard at Newcastle –
https://www.facebook.com/groups/584319688315165/

Closed Facebook group – Overheard at Leicester –
https://www.facebook.com/groups/1395453730700118/

Closed Facebook group – Overheard at Bournemouth! –
https://www.facebook.com/groups/1434396380123502/

Closed Facebook group – Official UWE Freshers 2017 – University of the West of England Bristol. –
https://www.facebook.com/groups/UWEBristolFreshers2017/

Closed Facebook group – Overheard at Manchester –
https://www.facebook.com/groups/528931703885381/

Closed Facebook group – Overheard at Salford –
https://www.facebook.com/groups/467400876768896/

Public Facebook group – Official UAL Freshers' 2017-18 –
https://www.facebook.com/groups/1438388166180000/about/

Total posts = 16

Appendix 22: *Facebook* post no.4: Tuesday 02/04/2018 at 19.30 – 20.30 hours

Xanax &Valium research

**Calling all those who have taken XANAX or VALIUM or other benzos

Helloooo! I'm a PGR student looking @ the use of common benzos such as XANAX and VALIUM!! If you've ever taken them after a night out... or have taken them once to pass out on a long journey or if you take them to self-medicate for anxiety... pleeeeease take part in my survey!

It's completely anonymous & only takes 5-10mins.
If you're worried about clicking on the link and it being traced back to your FB page, copy and paste it to your browser.

https://mmu.eu.qualtrics.com/jfe/form/SV_6KY863SliiKhyoR

Please help & share with anyone relevant!!! Xxxxxx

Closed Facebook group – Overheard at Liverpool Hope. – https://www.facebook.com/groups/579754708776047/

Closed Facebook group – Overheard at Manchester Metropolitan – https://www.facebook.com/groups/342914559180413/

Public Facebook group – Overheard at Lancaster – https://www.facebook.com/groups/overheard.at.lancaster/?fref=nf

Closed Facebook group – Overheard at Durham Uni – https://www.facebook.com/groups/99499879280/

Closed Facebook group – Overheard at Newcastle – https://www.facebook.com/groups/584319688315165/

Closed Facebook group – Overheard at Leicester – https://www.facebook.com/groups/1395453730700118/

Closed Facebook group – Overheard at Bournemouth! – https://www.facebook.com/groups/1434396380123502/

Closed Facebook group – Official UWE Freshers 2017 – University of the West of England Bristol. – https://www.facebook.com/groups/UWEBristolFreshers2017/

Public Facebook group – Official UAL Freshers' 2017-18 – https://www.facebook.com/groups/1438388166180000/about/

Total posts = 9

Appendix 23: *Facebook* post no.5: Tuesday 03/04/2018 at 19.30 – 20.00 hours

Xanax &Valium research

**Calling all those who have taken XANAX or VALIUM or other benzos

Helloooo! I'm a PGR student looking @ the use of common benzos such as XANAX and VALIUM!! If you've ever taken them after a night out... or have taken them once to pass out on a long journey or if you take them to self-medicate for anxiety... pleeeeease take part in my survey!

It's completely anonymous & only takes 5-10mins.
If you're worried about clicking on the link and it being traced back to your FB page, copy and paste it to your browser.

https://mmu.eu.qualtrics.com/jfe/form/SV_6KY863SliiKhyoR

Please help & share with anyone relevant!!! Xxxxxx

Closed Facebook group – Overheard at Hallam – https://www.facebook.com/groups/564632107000144/about/

Closed Facebook group – Overheard at Plymouth – https://www.facebook.com/groups/600563860014085/

Closed Facebook group – Overheard at Brookes. – https://www.facebook.com/groups/1502526173339410/

Closed Facebook group – Overheard at UWE – https://www.facebook.com/groups/976667319028790/

Closed Facebook group – Overheard at Birmingham – https://www.facebook.com/groups/430446117114537/

Closed Facebook group – Overheard at Bristol. – https://www.facebook.com/groups/745593605504743/

Closed Facebook group – Overheard at Hull – https://www.facebook.com/groups/890616594291763/

Closed Facebook group – Overheard at Bath –
https://www.facebook.com/groups/475984969255191/

Closed Facebook group – Overheard at Portsmouth –
https://www.facebook.com/groups/188927307973292/

Closed Facebook group – Overheard at Coventry –
https://www.facebook.com/groups/1507028259568885/

Closed Facebook group – Overheard at Kings. –
https://www.facebook.com/groups/1453411631548774/

Closed Facebook group – Overheard at Northumbria –
https://www.facebook.com/groups/577299895688491/

Closed Facebook group – Overheard at Liverpool –
https://www.facebook.com/groups/589856854403117/

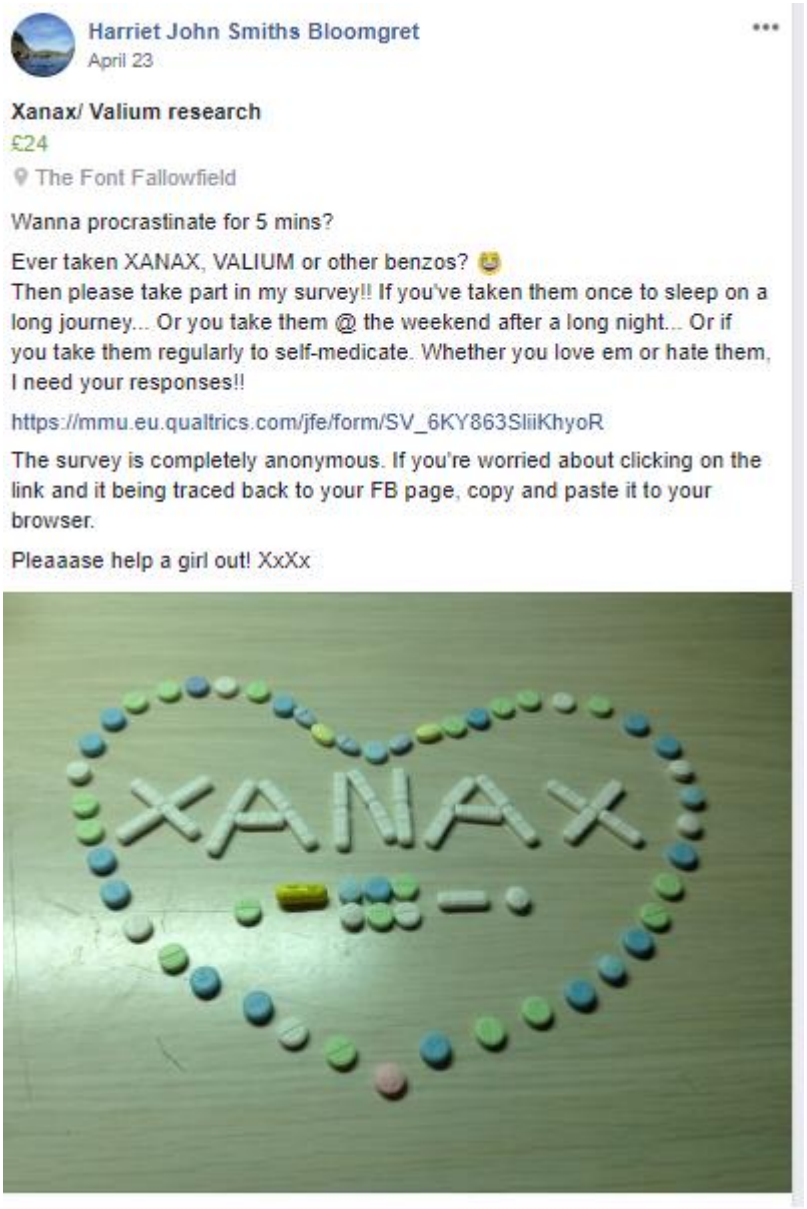
Closed Facebook group – Overheard at John Moores –
https://www.facebook.com/groups/574035859331989/

Closed Facebook group – Overheard at Heriot-Watt. –
https://www.facebook.com/groups/1541428172799204/

Closed Facebook group – Overheard at Leeds. –
https://www.facebook.com/groups/721002447924770/

Total posts = 16

Appendix 24: *Facebook* post no.6: Monday 23/04/2018 at 18.30 – 19.30 hours



Personal Facebook page – https://www.facebook.com/harrietbloomfield

Public Facebook group – Leeds Uni Tickets – https://www.facebook.com/groups/117100318646642/

Closed Facebook group – Fallowfield Students Group (FSG) – https://www.facebook.com/groups/Fallowfieldbuynselltickets/

Public Facebook group – Manchester Uni & Manchester Met Freshers 2017-2018 – https://www.facebook.com/groups/938866779473395/

Closed Facebook group – Fallowfield Buy / Sell tickets 2017/18 – https://www.facebook.com/groups/1244490875607605/

Public Facebook group – Edinburgh Ticket Exchange –
https://www.facebook.com/groups/166610787148289/about/

Closed Facebook group – Overheard at Durham Uni –
https://www.facebook.com/groups/99499879280/

Closed Facebook group – Overheard at Newcastle –
https://www.facebook.com/groups/584319688315165/

Closed Facebook group – Overheard at Bournemouth! –
https://www.facebook.com/groups/1434396380123502/

Closed Facebook group – Official UWE Freshers 2017 – University of the West of England Bristol. –
https://www.facebook.com/groups/UWEBristolFreshers2017/

Closed Facebook group – Overheard at Manchester –
https://www.facebook.com/groups/528931703885381/

Closed Facebook group – Overheard at Salford –
https://www.facebook.com/groups/467400876768896/

Public Facebook group – Official UAL Freshers' 2017-18 –
https://www.facebook.com/groups/1438388166180000/about/

Closed Facebook group – Overheard at Hallam –
https://www.facebook.com/groups/564632107000144/about/

Closed Facebook group – Overheard at UWE –
https://www.facebook.com/groups/976667319028790/

Closed Facebook group – Overheard at Birmingham –
https://www.facebook.com/groups/430446117114537/

Closed Facebook group – Overheard at Bristol. –
https://www.facebook.com/groups/745593605504743/

Closed Facebook group – Overheard at Bath –
https://www.facebook.com/groups/475984969255191/

Closed Facebook group – Overheard at Portsmouth –
https://www.facebook.com/groups/188927307973292/

Closed Facebook group – Overheard at Coventry –
https://www.facebook.com/groups/1507028259568885/

Closed Facebook group – Overheard at Kings. –
https://www.facebook.com/groups/1453411631548774/

Closed Facebook group – Overheard at Northumbria –
https://www.facebook.com/groups/577299895688491/

Closed Facebook group – Overheard at Liverpool –
https://www.facebook.com/groups/589856854403117/

Closed Facebook group – Overheard at John Moores –
https://www.facebook.com/groups/574035859331989/

Closed Facebook group – Overheard at Heriot-Watt. –
https://www.facebook.com/groups/1541428172799204/

Closed Facebook group – Overheard at Leeds. –
https://www.facebook.com/groups/721002447924770/

Closed Facebook group – Buy/Sell Tickets (Notts uni) – UniSalad –
https://www.facebook.com/groups/352110954925626/

Closed Facebook group – Overheard at Queen Mary –
https://www.facebook.com/groups/705067822861454/

Closed Facebook group – Overheard at Beckett –
https://www.facebook.com/groups/1432905533608253/

Closed Facebook group – Overheard at Liverpool hope. –
https://www.facebook.com/groups/579754708776047/

Closed Facebook group – Overheard at Sheffield. –
https://www.facebook.com/groups/743908699022155/

Closed Facebook group – Overheard at Central St Martins –
https://www.facebook.com/groups/1456038254617516/

Closed Facebook group – Overheard at Lincoln –
https://www.facebook.com/groups/1571879906359544/

Closed Facebook group – Overheard at Trent. –
https://www.facebook.com/groups/1589775194583920/

Closed Facebook group – Overheard at Imperial –
https://www.facebook.com/groups/646648388729305/

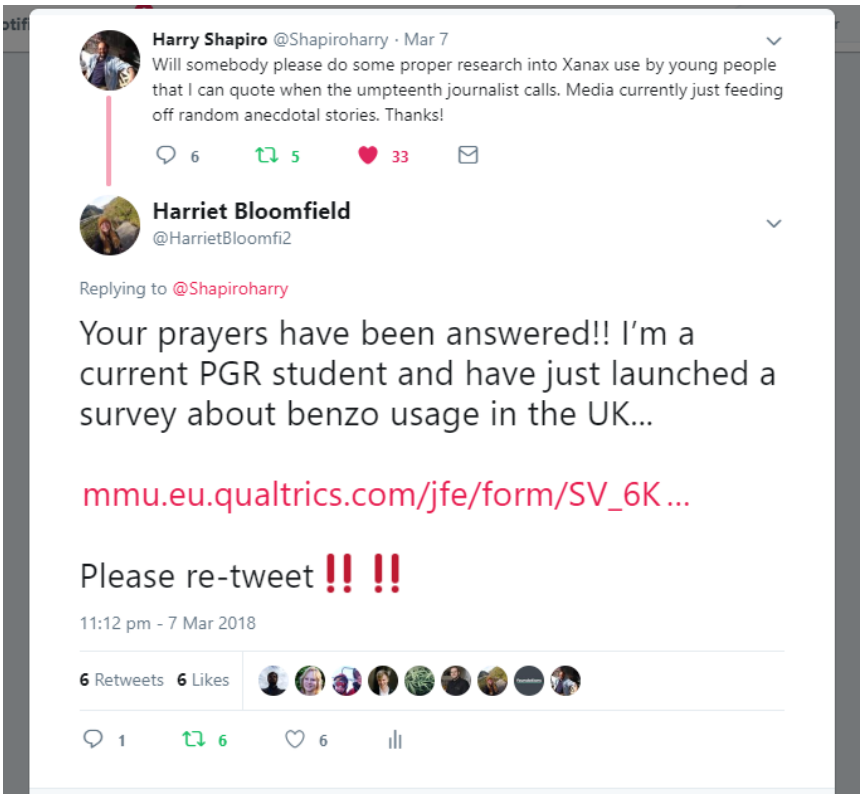
Closed Facebook group – Overheard at Colchester Sixth Form –
https://www.facebook.com/groups/187934794639632/?ref=br_rs

Closed Facebook group – Clifton and Stoke Bishop Tickets –
https://www.facebook.com/groups/632857390090581/

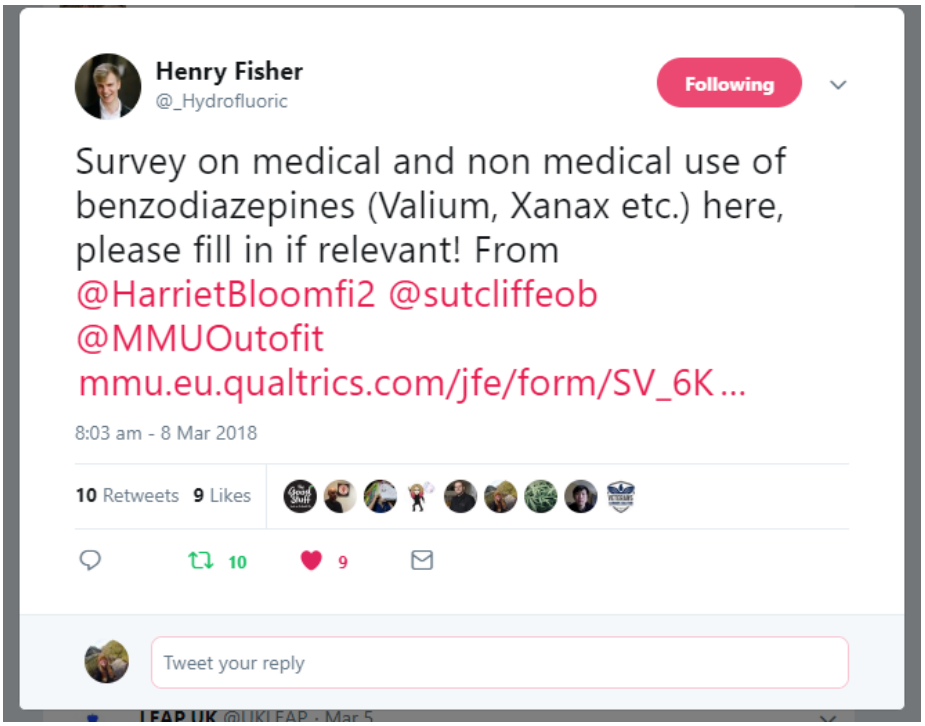
Total posts = 37

Appendix 25: Tweet no.1: Thursday 1/03/2018 at 11:49am

Appendix 26: Tweet no.2: Harry Shapiro and response on Wednesday 07/03/2018 at 23:12pm



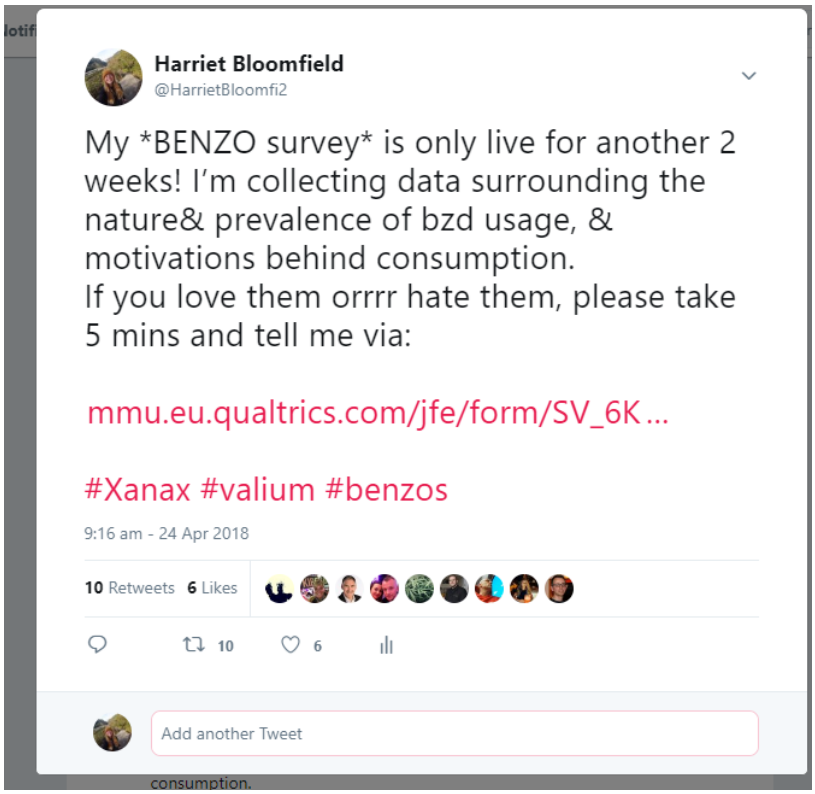
Appendix 27: Tweet no.3: Henry Fisher on Thursday 08/03/2018 at 08:03am



Appendix 28: Tweet no.4: Response to other Twitter users on Tuesday 13/03/2018 at 17:07pm

Appendix 29: Tweet no.5: Max Daly on Tuesday 27/03/2018 at 14.43pm

Appendix 30: Tweet no.6: Tuesday 24/04/2018 at 09.16am



Appendix 30a: Full table of postings and response rates

DATE	Number of responses	Where the link was posted
March		
01/03/2018	20	*Facebook*, *Twitter* (Harriet Bloomfield)
02/03/2018	31	
03/03/2018	3	
04/03/2018	3	
05/03/2018	9	
06/03/2018	2	
07/03/2018	3	*Twitter* (reply to Harry Shapiro)
08/03/2018	6	*Twitter* (Henry Fisher),
09/03/2018	8	
10/03/2018	9	
11/03/2018	4	
12/03/2018	2	
13/03/2018	10	*Twitter* (Harriet Bloomfield reply to Hannah Ewens and others)
14/03/2018	8	*Facebook*
15/03/2018	4	
16/03/2018	1	
17/03/2018	2	
18/03/2018	0	
19/03/2018	0	
20/03/2018	0	
21/03/2018	1	
22/03/2018	1	
23/03/2018	6	
24/03/2018	1	
25/03/2018	0	
26/03/2018	86	*Facebook*
27/03/2018	108	*Twitter* (Max Daly)
28/03/2018	32	
29/03/2018	17	
30/03/2018	13	
31/03/2018	8	
April		
01/04/2018	19	
02/04/2018	24	*Facebook*
03/04/2018	21	*Facebook*
04/04/2018	6	
05/04/2018	9	
06/04/2018	5	
07/04/2018	2	

08/04/2018	0	
09/04/2018	2	
10/04/2018	2	
11/04/2018	0	
12/04/2018	0	
13/04/2018	0	
14/04/2018	0	
15/04/2018	1	
16/04/2018	2	
17/04/2018	3	
18/04/2018	2	
19/04/2018	1	
20/04/2018	0	
21/04/2018	0	
22/04/2018	0	
23/04/2018	100	*Facebook*
24/04/2018	55	*Twitter*
25/04/2018	7	
26/04/2018	3	
27/04/2018	2	
28/04/2018	1	
29/04/2018	2	
30/04/2018	4	
May		
01/05/2018	4	
02/05/2018	2	
03/05/2018	1	
04/05/2018	0	
05/05/2018	0	
06/05/2018	2	
07/05/2018	0	
08/05/2018	6	
09/05/2018	1	
10/05/2018	3	
11/05/2018	3	*The TAB* article
12/05/2018	6	
13/05/2018	3	
14/05/2018	3	
15/05/2018	1	
16/05/2018	0	
17/05/2018	2	
18/05/2018	0	
19/05/2018	1	
20/05/2018	0	
21/05/2018	1	

22/05/2018	2	
23/05/2018	0	
24/05/2018	0	
25/05/2018	2	
26/05/2018	0	
27/05/2018	0	
28/05/2018	0	
29/05/2018	1	
30/05/2018	0	
31/05/2018	0	
June		
01/06/2018	1	
02/06/2018	0	
03/06/2018	0	
04/06/2018	1	
05/06/2018	0	
06/06/2018	0	
07/06/2018	0	
08/06/2018	1	
TOTAL	**718**	**(minus 2x pilot tests)**

Appendix 31: Snippets of interviews for *TAB* article

P: Male, 19

I: Which benzos have you taken, and which is your favourite?

P: I've only taken Valium, don't know the others

I: What is your reason for taking them?

P: I only really take Vals occasionally after a night out to get to sleep. If I've been dropping at a festival and carry on 'til about 6am, I'm not going to be able to get to sleep without them

P1: Female, 19

P2: Female, 20

I: Which benzos have you taken, and which is your favourite?

P2: I've tried both, but Valium is the best I think because it's not as strong as Xanax

P1: Xanax is way too strong, but Valium doesn't do it for me anymore… I end up taking a few after a night out to get a solid sleep but then the few days after that I feel so spaced out and can't do anything productive

P2: Hmm yeah, I kinda start being productive on them but once I started taking Vallies in the morning to get me through my art deadline. I got it done and did well but I can hardly remember that week which is freaky

P: Female, 19

I: Have you had any bad experiences with benzos?

P: I once took a Xanax just before Antwerp and didn't make it outside the house, I was totally zombie-fied and slept for 2 days. My friend said I was so weird at pres… apparently I was undressing and dancing on top of her boyfriend but I can't remember a thing. It's so weird and embarrassing I definitely won't take it again.

P: Male, 22

I: Which benzos have you tried?

P: Just Valium. I've never taken Xanax because I see what's happened to my mates when they're on them. They literally just flop, can't speak properly and dribble everywhere. It is funny but then just goes weird very quickly

Appendix 32: Full copy of *The TAB* article

We asked Manchester students about their experiences with Xanax and Valium

Benzo consumption is a rising trend in our student community - Harriet Bloomgret ***MANCHESTER***

Valium, Xanax, Klonopin and other benzos are powerful hypnotic and anxiolytic drugs which are traditionally prescribed to treat severe cases of insomnia, anxiety and panic disorder. There has been a rise in trends of recreational consumption amongst students, but we found that people had mixed reviews about them. We reached out to students about "the trendy" drugs. How much were people taking? Why? And since when did it become so fashionable?

Benzos can be very strong, especially when mixed with other depressant substances like alcohol. We spoke to a few students who describe taking several benzos, either in one go or throughout the night, and often mix the drugs with other substances.

One of the most popular uses of Valium is as a sleeping pill. Students use it after a night of partying to get to sleep soundly and eliminate the inevitable shit-show hangover/comedown combination the next day.

Sam, 19

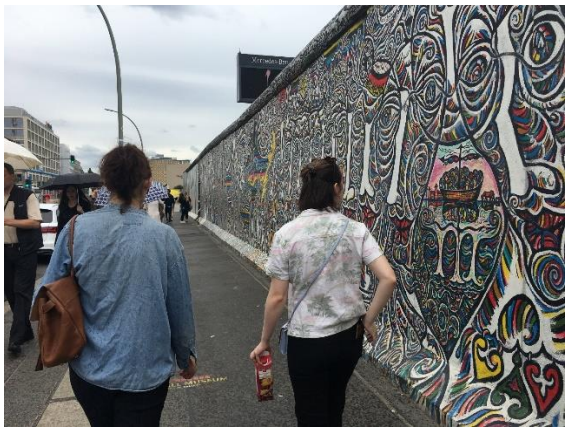
> *"I only really take Vals occasionally after a night out to get to sleep. If I've been dropping at a festival and carry on til about 6am, I'm not going to be able to get to sleep without them"*

Although Valium might be good if you're having trouble sleeping… Its active metabolite elimination half-life is 4 days, meaning you could feel tired and lethargic for a while after.

Sarah, 19, from UoM and Cat, 20, from MSoA

"Valium doesn't do it for me anymore… I end up taking a few after a night out to get a solid sleep but then the few days after that I feel so spaced out and can't do anything productive"

"I started taking Vallies in the morning to get me through my art deadline. I got it done and did well but I can hardly remember that week which is freaky"



Xanax however, is much more potent. When putting things into perspective, the equivalent dosage (compared to 5mg of Valium) of Xanax would be 0.25mg… That's merely a quarter of an average Xanax bar. With a half-life of 6-27 (based on 0.25mg), the drug is shorter acting than Valium if it's taken in the right dose.

Caroline, 19

"I once took a Xanax just before Antwerp and didn't make it outside the house, I was totally zombie-fied and slept for 2 days. My friend said I was so weird at pres… apparently I was undressing and dancing on top of her boyfriend but I can't remember a thing. It's so weird and embarrassing I definitely won't do take it again"

Alex (22) said:

"I've never taken Xanax because I see what's happened to my mates when they're on them. They literally just flop, can't speak properly and dribble everywhere. It is funny but then just goes weird very quickly…"

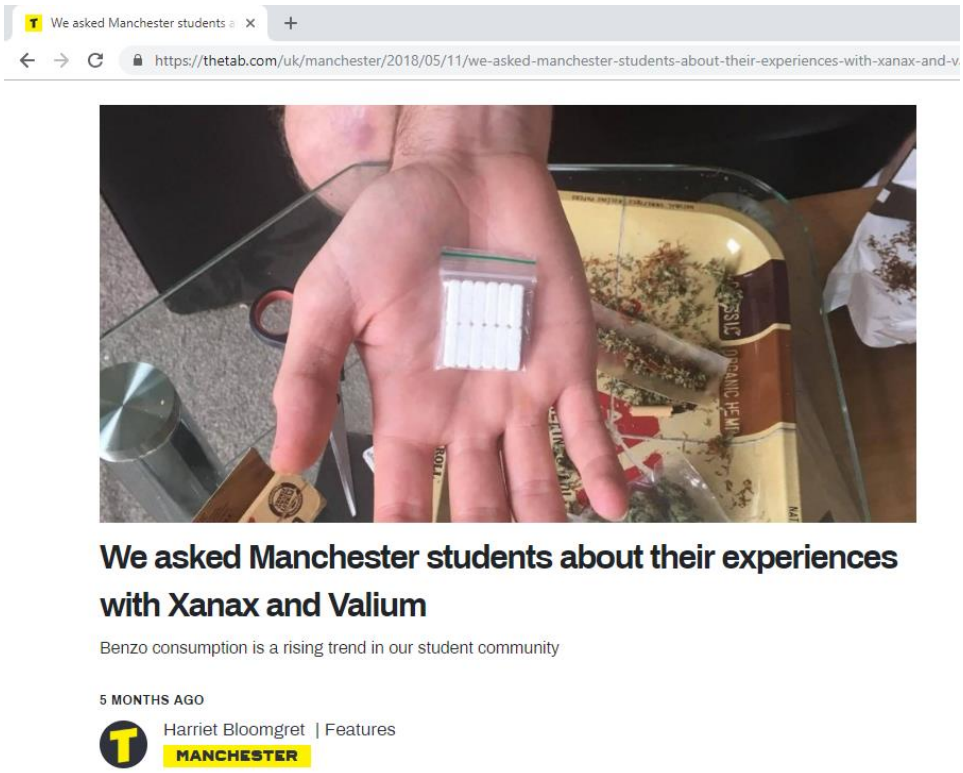
But why now? Where have they come from? David Sunter, a former researcher at Manchester Metropolitan University claims:

"There's definitely been a shift away from smoking Weed… It's just not the same anymore with all these new strengths like skunk. It sends people loopy… But with benzos you can just take one or two and pass out"

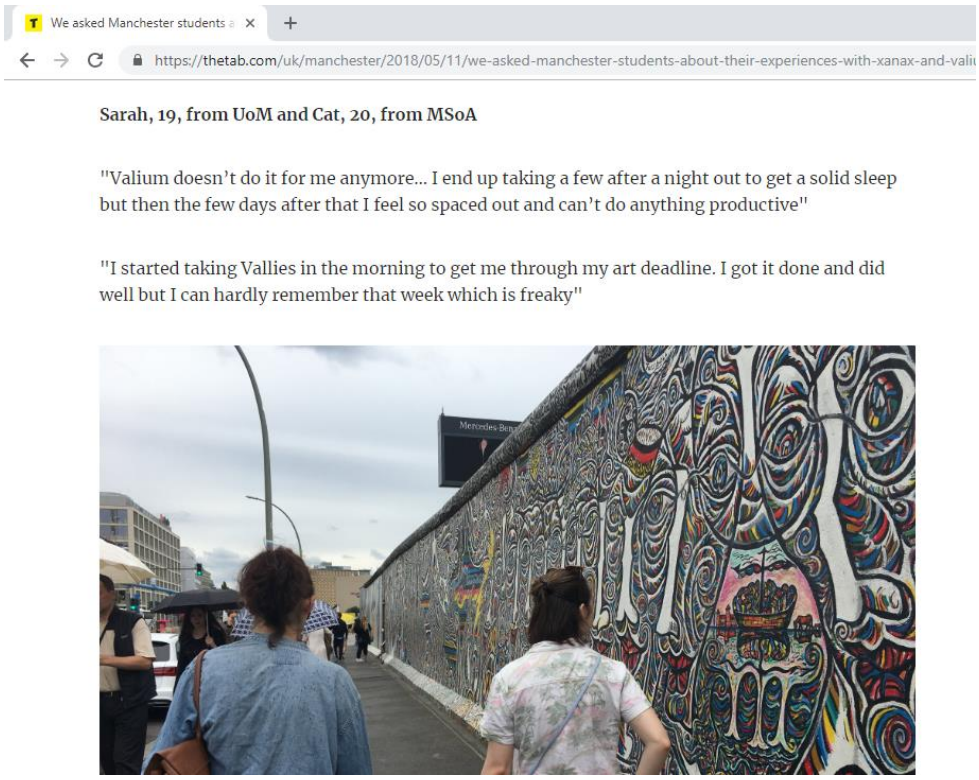
Whether you love them or hate them, please fill in this **survey**.

Harriet Bloomgret

Appendix 33: Screenshot of *The TAB* article 1



Appendix 34: Screenshot of *The TAB* article 2



Appendix 35: Interview guide

**Must make them read the participant information sheet first*
**Must sign form of consent prior to the interview*

1. Gather participants demographics – gender, age, occupation, uni town and home town

2. Which benzo's do you use/ have you used, and WHY?

3. How often do you use them and at what dosage?

4. What substances do you take them before/ alongside/ after?

5. How do you take them? (Orally/ sniff/ inject)

6. Where do you get your BZDs from? How/ why? & in what quantity

7. Do you think benzo usage is a result of being in a big city like Manchester?

8. Do you think BZDs are a replacement of more traditional drug like cannabis? Or even heroin? (Speak about Scotland's Valium crisis)

9. Do you think there is a correlation between benzo use and the use of other substances? In particular, the drugs which you snort (cocaine, ketamine)

Appendix 36: Participant information sheet for interviewees

I am carrying out research regarding the medical and non-medical use of benzodiazepines such as Diazepam (trade name Valium) and Alprazolam (trade name Xanax). Participants are required to have personal experience of benzodiazepine usage.

Background

Benzodiazepines are classed as hypnotic and anxiolytic drugs which are traditionally prescribed to treat insomnia and assist in the management of mental health issues such as anxiety and panic disorder. Alongside medicinal usage, benzodiazepines are also used for recreational purposes and to self-medicate.

There is little knowledge regarding the supply of the diverted and illicitly supplied medicines, however concerns of casualties and at worst death are a result of misuse, poly-drug use and the consumption of counterfeit tablets, which is spreading rapidly in countries such as Scotland and the US.

What is the purpose of this research?

There is little information surrounding the prevalence and nature of benzodiazepine usage within the UK. This research wishes to explore:

- Which types of benzos people are taking
- Why people are taking them
- How many they are taking and at what dosage
- The context in which they are being taken
- The market of illicitly supplied pharmaceuticals

A quantitative survey will be complimented with in-depth one-to-one interviews and chemical analyses of seized street samples.

What will happen with the results of this study?

With your consent, the interview will be audio recorded before being transcribed and stored in a secure place. All responses are completely anonymous; in the interviews your real name will not be used. The data will be used in the final report which will be published.

The findings will be used: to gain a clearer understanding of the prevalence and nature of benzodiazepine usage; to build an understanding of the supply of benzodiazepines; to inform users about the harms of recreational benzodiazepine usage; to make individuals aware of counterfeit samples and; inform individuals about the dangers surrounding poly drug use.

Why do you want me to take part?

As an individual with direct experience of benzodiazepine usage, it is hoped that you will provide insight into: the extent of benzodiazepine usage (medicinal and non-medicinal) and the reasons behind consumption.

What will it involve?

You will be asked to take part in a one-to-one interview which will last around 30-60 minutes. The interviews will be audio recorded and then destroyed once it has been typed up. The transcript will be secured in a secure place.

Confidentiality

All the responses you provide during the full course of this research will maintain strictly confidential. You will not be identifiable in any publications. Your anonymity will be preserved and full consent forms will be issued. Throughout this research, ethical guidelines are adopted from the Social Research Association (2003).

Contact details

Head researcher: Harriet Bloomfield, Masters by Research student at Manchester Metropolitan University, M15 6LL. Email: harriet.bloomfield@stu.mmu.ac.uk

Research supervisor: Dr Rob Ralphs, supervisor and reader in Criminology at Manchester Metropolitan University, M15 6LL. Email: R.Ralphs@mmu.ac.uk. Tel: 0161 247 3014

Thank you for participating!

Appendix 37: Consent form for interviewees

Please insert your initials along the left hand side to confirm you are happy to continue.

☐	1. I can confirm that I have read and understood the information sheet dated and have had the opportunity to ask questions about the interview procedure.
☐	2. I understand that my participation is voluntary and that I am free to withdraw at any time.
☐	3. I understand that my identity will remain anonymous.
☐	4. I understand that at my request, a copy of my data can be made available to me.

_____	_____	_____
Name of Participant	Date	Signature
_____	_____	_____
Researcher	Date	Signature

To be signed and dated in presence of the participant

Appendix 38: Survey key code

Each question included

98 – Missing

99 – Not applicable

1. Age
   - 18-21 - 1
   - 22-25 - 2
   - 26-30 - 3
   - 31-40 - 4
   - 41+ - 5
2. Sex
   - Male – 1
   - Female – 2
   - Transgender – 3
3. Sexuality
   - Heterosexual/ straight - 1
   - Homosexual/ gay/ lesbian - 2
   - Bisexual - 3
   - A-sexual - 4
   - I'd rather not say - 5
   - Other – 6
4. Ethnicity
   - White - 1
   - Black - 2
   - Asian - 3
   - Mixed- 4
   - Chinese – 5
   - Arab – 6
   - Hispanic – 7
5. Where are you based?
   - South East – 1
   - London – 2

- North West – 3
- East of England – 4
- West Midlands – 5
- South West – 6
- Yorkshire and the Humber – 7
- East Midlands – 8
- North East – 9
- Scotland – 10
- Ireland – 11
- Wales – 12
- Outside of England – 13
- I'd rather not say – 14

6. What is your occupation?
    - Full-time/ part-time student - 1
    - Employed (paid work) – 2
    - Unemployed – 3
    - Other – 4
7. Which benzo(s) have you taken?

Split into 9 separate headings on SPSS (Valium (Diazepam), Xanax (Alprazolam), Ativan (Lorazepam), Klonopin (Clonazepam), Tranxene (Clorazepate), Librium (Chlordiazepoxide), Estazolam, Estizolam, Other)

Then coded each:

1 = yes

2 = no

98 = missing

99 = not applicable

8. Which do you currently use/ have used in the past 2 months?

Split into 10 separate headings on SPSS (Same as above + 'not recently')

Then coded each:

1 = yes

2 = no

98 = missing

99 = not applicable

9. Preferred benzo
    - Valium (Diazepam) – 1
    - Xanax (Alprazolam) – 2
    - Ativan (Lorazepam) – 3
    - Klonopin (Clonazepam) – 4
    - Tranxene (Clorazepate) – 5
    - Librium (Chlordiazepoxide) – 6
    - Estazolam – 7
    - Eitzolam – 8
    - Other – 9
    - No preference – 10
    - None, dislike them all – 11
10. Why is this your preferred benzo?

Text answer. Exported back into Excel and split further:

1. Valium
2. Xanax

Useful quotes used throughout the results section.

11. User motivations?

Split into 6 separate headings on SPSS (For anxiety or similar issues – prescribed, for anxiety or similar issues – non-prescribed, to get to sleep, to get high, to counteract the effects of stimulants and other). 'Other' heading was elaborated (to relax, for a confidence boost, for long journeys, for physical pain relief and they are good with alcohol).

Then coded each:

1 = yes

2 = no

98 = missing

99 = not applicable

12. How often
    - Daily - 1
    - Weekly - 2
    - Fortnightly - 3
    - Monthly - 4
    - Every few months - 5
    - Rarely (yearly/ only tried once) – 6
    - Not for a long time – 7
    - Binge – 8
    - Whenever I need to – 9
    - Other – 10
13. How many on each occasion

Split into 7 different headings on SPSS (Valium, Xanax, Ativan, Klonopin, Tranxene, Librium, Estazolam)

Then coded each:

1 = yes

2 = no

98 = missing

99 = not applicable

Valium and Xanax were the only two with a significant amount of respondents therefore the others were not mentioned in the results.

14. MG and dosage context

Answers were exported back to Excel and split as follows:

1. Valium

2. Xanax

15. How do you consume your benzos?

Split into 6 headings on SPSS (swallow, snort, inject, sublingually, chew it and dissolve in drink)

Then coded each:

1 = yes

2 = no

98 = missing

99 = not applicable

16. Memorable encounter

Free text. Answers were split into:

1. Positive
2. Negative

Most positive answers were related to the recreational use of benzodiazepines and used to elaborate statistics for user motivations.

Most negative encounters were used to elaborate points previously made regarding the adverse negative effects of benzodiazepines.

17. Other substance use

Split into 11 headings (alcohol, tobacco, cannabis, MDMA, cocaine, ketamine, hallucinogens, amphetamines (speed), Modafinil/Ritalin, opiates/crack cocaine, other).

Then coded each:

1 = yes

2 = no

98 = missing

99 = not applicable

18. Substance use alongside benzos

Split into 12 headings (alcohol, tobacco, cannabis, MDMA, cocaine, ketamine, hallucinogens, amphetamines (speed), Modafinil/Ritalin, opiates/crack cocaine, nothing, other).

Then coded each:

1 = yes

2 = no

98 = missing

99 = not applicable

19. Source

Split into 9 headings on SPSS (prescribed, non-prescribed (diverted), through a friend, through a family member, from a work or study colleague, online – clearweb, online – darkweb, dealer, other)

Then coded each:

1 = yes

2 = no

98 = missing

99 = not applicable

20. If you chose dealer, is it the same person who deals…

Split into 13 headings on SPSS (Only benzos, cannabis, MDMA (crystal/ powder form), MDMA (pills), cocaine, ketamine, LSD/ acid, magic mushrooms, amphetamines, Modafinil/Ritalin, opiates, crack cocaine, other).

Then coded each:

1 = yes

2 = no

98 = missing

99 = not applicable

21. Price

There were a lot of varied answers for Q21, therefore bar Valium and Xanax, others were deleted. Valium had 8 headings (don't pay, 50p, £1, £1.50, £2, £3, £4, other) and Xanax also had 8 headings (don't pay, 50p, £1, £1.50, £2, £3, £4, other).

Then coded each:

1 = yes

2 = no

98 = missing

99 = not applicable

Additional comments to Q21

Text answers were transferred back to Excel and relevant, descriptive answers were taken and placed throughout the survey to enhance statistical findings.

22. How many purchase
    - 1-5 - 1
    - 6-10 - 2
    - 11-20 - 3
    - 21-50 - 4
    - 51+ - 5
23. Why chose benzos

8 subheadings were created on SPSS (it is a prescribed drug, it is the only drug I have tried to get this effect, it has the best desired effect, they are cheap, they are easily accessible, they are easy to hide, they are easy to consume, other (text))

Then coded each:

1 = yes

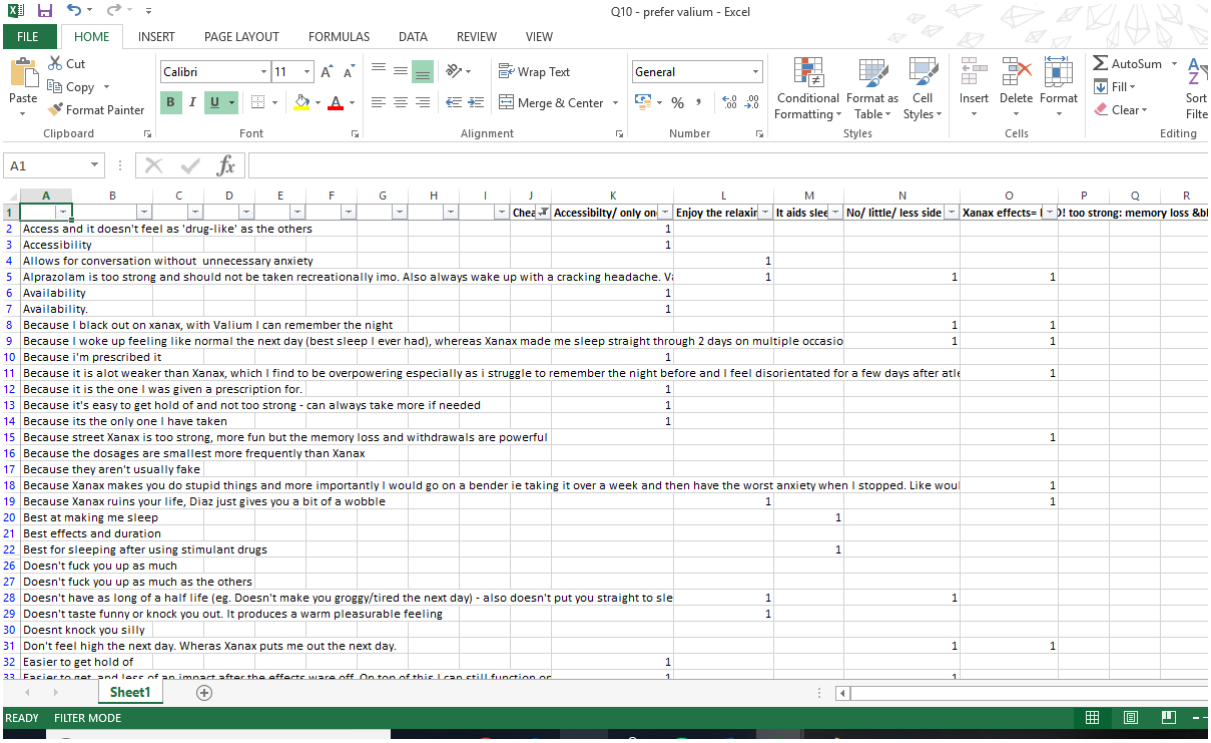
2 = no

98 = missing

99 = not applicable

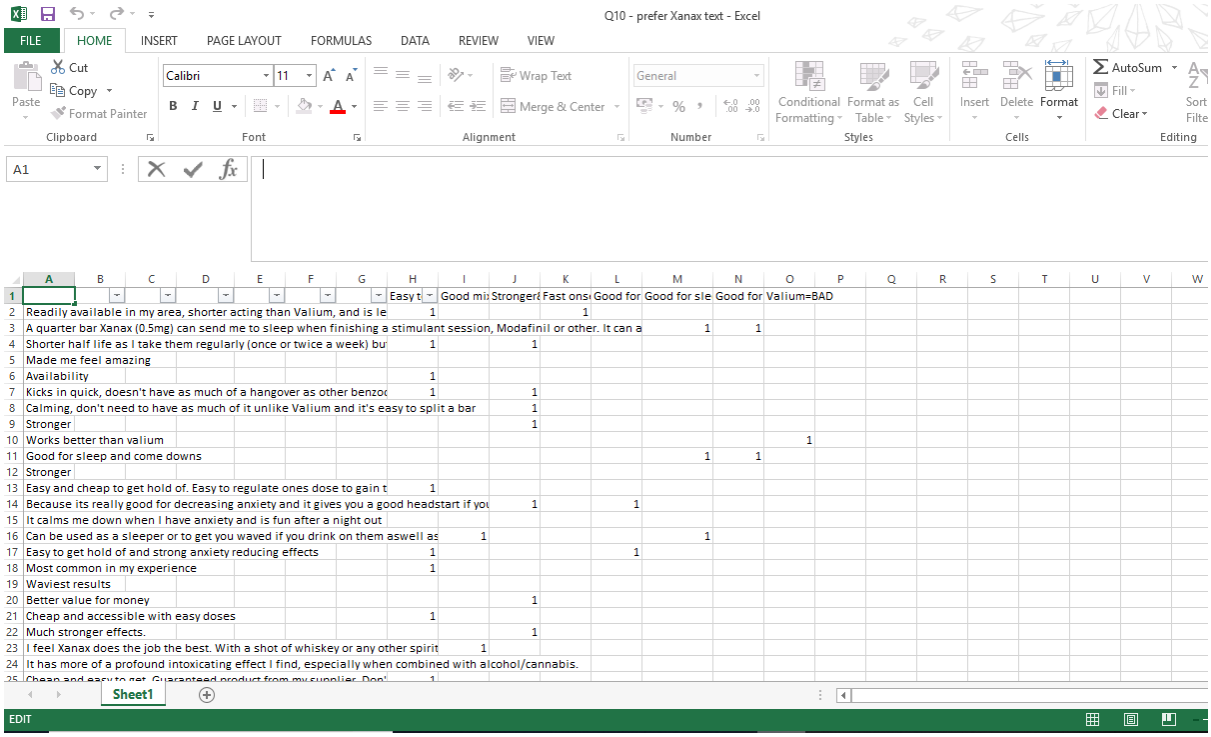
‘Other’ answers were exported back to Excel and relevant and important quotes were extracted and put throughout the results section.

Appendix 39: Coding question 10: Valium



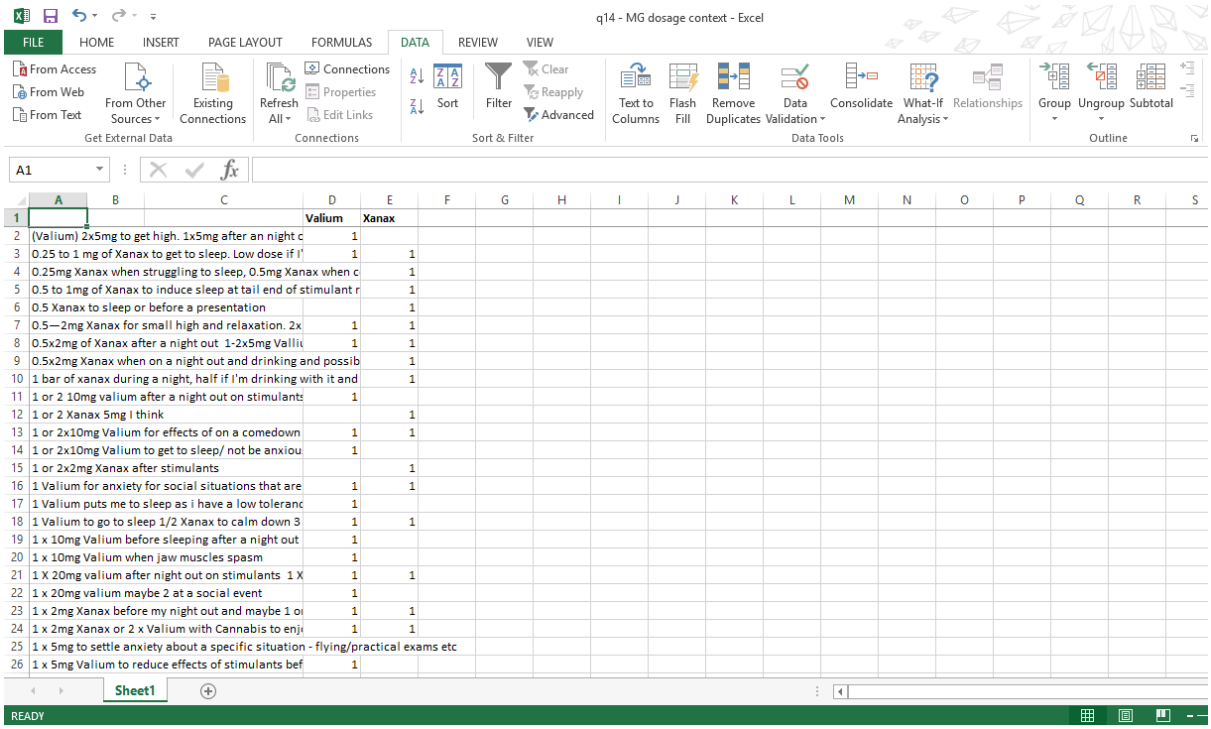
	A	K	L	M	N	O
1		Accessibilty/ only on	Enjoy the relaxir	It aids slee	No/ little/ less side	Xanax effects= l
2	Access and it doesn't feel as 'drug-like' as the others	1				
3	Accessibility	1				
4	Allows for conversation without unnecessary anxiety		1			
5	Alprazolam is too strong and should not be taken recreationally imo. Also always wake up with a cracking headache. Vi		1		1	1
6	Availability	1				
7	Availability.	1				
8	Because I black out on xanax, with Valium I can remember the night				1	1
9	Because I woke up feeling like normal the next day (best sleep I ever had), whereas Xanax made me sleep straight through 2 days on multiple occasio				1	1
10	Because i'm prescribed it	1				
11	Because it is alot weaker than Xanax, which I find to be overpowering especially as i struggle to remember the night before and I feel disorientated for a few days after atle					1
12	Because it is the one I was given a prescription for.	1				
13	Because it's easy to get hold of and not too strong - can always take more if needed	1				
14	Because its the only one I have taken	1				
15	Because street Xanax is too strong, more fun but the memory loss and withdrawals are powerful					1
16	Because the dosages are smallest more frequently than Xanax					
17	Because they aren't usually fake					
18	Because Xanax makes you do stupid things and more importantly I would go on a bender ie taking it over a week and then have the worst anxiety when I stopped. Like woul					1
19	Because Xanax ruins your life, Diaz just gives you a bit of a wobble		1			1
20	Best at making me sleep			1		
21	Best effects and duration					
22	Best for sleeping after using stimulant drugs			1		
26	Doesn't fuck you up as much					
27	Doesn't fuck you up as much as the others					
28	Doesn't have as long of a half life (eg. Doesn't make you groggy/tired the next day) - also doesn't put you straight to sle		1		1	
29	Doesn't taste funny or knock you out. It produces a warm pleasurable feeling		1			
30	Doesnt knock you silly					
31	Don't feel high the next day. Wheras Xanax puts me out the next day.				1	1
32	Easier to get hold of	1				

Appendix 40: Coding question 10: Xanax



	A	H	I	J	K	L	M	N	O
1		Easy t	Good mi	Stronger	Fast ons	Good for	Good for sle	Good for	Valium=BAD
2	Readily available in my area, shorter acting than Valium, and is le	1			1				
3	A quarter bar Xanax (0.5mg) can send me to sleep when finishing a stimulant session, Modafinil or other. It can a						1	1	
4	Shorter half life as I take them regularly (once or twice a week) bu	1		1					
5	Made me feel amazing								
6	Availability	1							
7	Kicks in quick, doesn't have as much of a hangover as other benzoc	1		1					
8	Calming, don't need to have as much of it unlike Valium and it's easy to split a bar			1					
9	Stronger			1					
10	Works better than valium							1	
11	Good for sleep and come downs						1	1	
12	Stronger								
13	Easy and cheap to get hold of. Easy to regulate ones dose to gain t	1							
14	Because its really good for decreasing anxiety and it gives you a good headstart if you			1		1			
15	It calms me down when I have anxiety and is fun after a night out								
16	Can be used as a sleeper or to get you waved if you drink on them aswell as		1				1		
17	Easy to get hold of and strong anxiety reducing effects	1				1			
18	Most common in my experience	1							
19	Waviest results								
20	Better value for money			1					
21	Cheap and accessible with easy doses	1							
22	Much stronger effects.			1					
23	I feel Xanax does the job the best. With a shot of whiskey or any other spirit		1						
24	It has more of a profound intoxicating effect I find, especially when combined with alcohol/cannabis.								

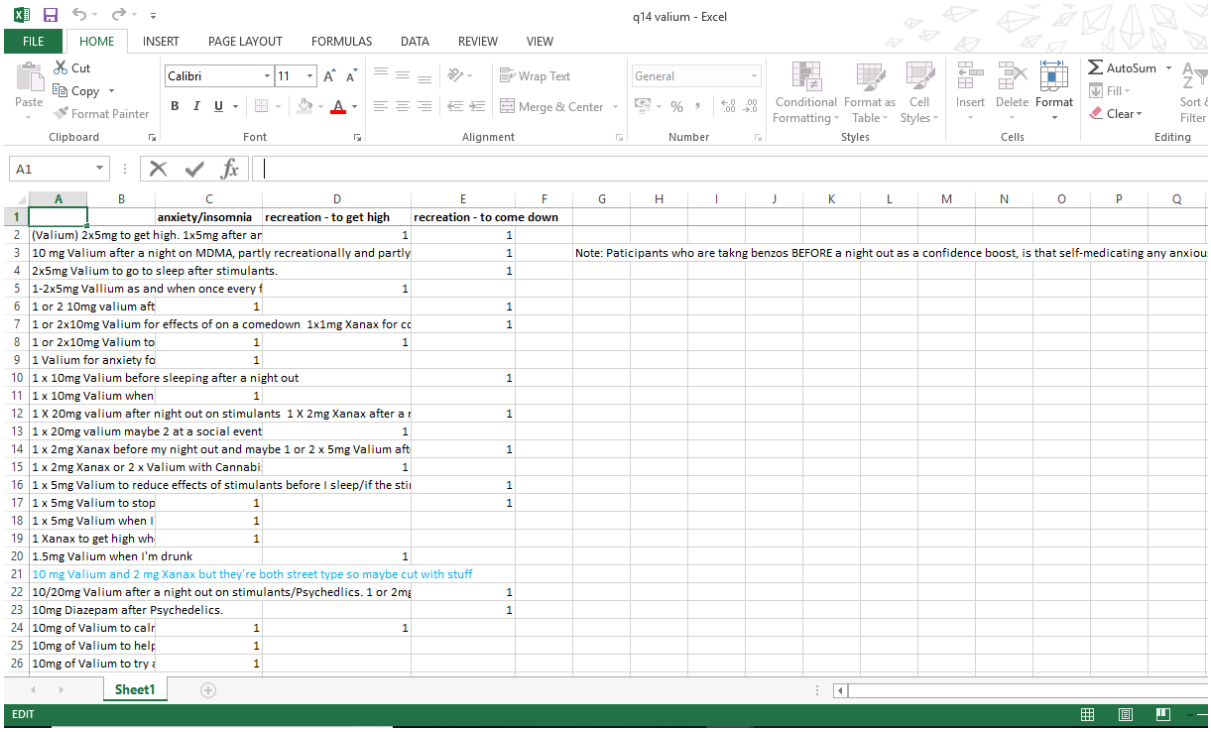
Appendix 41: Coding question 14: splitting Valium and Xanax



q14 - MG dosage context - Excel

	A	D	E
1		Valium	Xanax
2	(Valium) 2x5mg to get high. 1x5mg after an night c	1	
3	0.25 to 1 mg of Xanax to get to sleep. Low dose if I'	1	1
4	0.25mg Xanax when struggling to sleep, 0.5mg Xanax when c		1
5	0.5 to 1mg of Xanax to induce sleep at tail end of stimulant r		1
6	0.5 Xanax to sleep or before a presentation		1
7	0.5—2mg Xanax for small high and relaxation. 2x	1	1
8	0.5x2mg of Xanax after a night out 1-2x5mg Valliu	1	1
9	0.5x2mg Xanax when on a night out and drinking and possib		1
10	1 bar of xanax during a night, half if I'm drinking with it and		1
11	1 or 2 10mg valium after a night out on stimulants	1	
12	1 or 2 Xanax 5mg I think		1
13	1 or 2x10mg Valium for effects of on a comedown	1	1
14	1 or 2x10mg Valium to get to sleep/ not be anxiou	1	
15	1 or 2x2mg Xanax after stimulants		1
16	1 Valium for anxiety for social situations that are	1	1
17	1 Valium puts me to sleep as i have a low toleranc	1	
18	1 Valium to go to sleep 1/2 Xanax to calm down 3	1	1
19	1 x 10mg Valium before sleeping after a night out	1	
20	1 x 10mg Valium when jaw muscles spasm	1	
21	1 X 20mg valium after night out on stimulants 1 X	1	1
22	1 x 20mg valium maybe 2 at a social event	1	
23	1 x 2mg Xanax before my night out and maybe 1 o	1	1
24	1 x 2mg Xanax or 2 x Valium with Cannabis to enj	1	1
25	1 x 5mg to settle anxiety about a specific situation - flying/practical exams etc		
26	1 x 5mg Valium to reduce effects of stimulants bef	1	

Appendix 42: Coding question 14: Valium subheadings



q14 valium - Excel

	A	C	D	E	G
1		anxiety/insomnia	recreation - to get high	recreation - to come down	
2	(Valium) 2x5mg to get high. 1x5mg after ar		1	1	
3	10 mg Valium after a night on MDMA, partly recreationally and partly			1	Note: Paticipants who are takng benzos BEFORE a night out as a confidence boost, is that self-medicating any anxiou
4	2x5mg Valium to go to sleep after stimulants.			1	
5	1-2x5mg Vallium as and when once every f		1		
6	1 or 2 10mg valium aft	1		1	
7	1 or 2x10mg Valium for effects of on a comedown 1x1mg Xanax for cc			1	
8	1 or 2x10mg Valium to	1	1		
9	1 Valium for anxiety fo	1			
10	1 x 10mg Valium before sleeping after a night out			1	
11	1 x 10mg Valium when	1			
12	1 X 20mg valium after night out on stimulants 1 X 2mg Xanax after a r			1	
13	1 x 20mg valium maybe 2 at a social event		1		
14	1 x 2mg Xanax before my night out and maybe 1 or 2 x 5mg Valium aft			1	
15	1 x 2mg Xanax or 2 x Valium with Cannabi		1		
16	1 x 5mg Valium to reduce effects of stimulants before I sleep/if the sti			1	
17	1 x 5mg Valium to stop	1		1	
18	1 x 5mg Valium when I	1			
19	1 Xanax to get high wh	1			
20	1.5mg Valium when I'm drunk		1		
21	10 mg Valium and 2 mg Xanax but they're both street type so maybe cut with stuff				
22	10/20mg Valium after a night out on stimulants/Psychedlics. 1 or 2mg			1	
23	10mg Diazepam after Psychedelics.			1	
24	10mg of Valium to calr	1	1		
25	10mg of Valium to help	1			
26	10mg of Valium to try a	1			

Appendix 43: Other accounts of memorable encounters (question 16)

'3 mg of Xanax, however mixed it with Cannabis. I went to the Manchester Christmas Markets with my friends. One of the weirdest experiences of my life. I was calm and in control throughout the situation. Food tasted amazing. I was with a group of friends all experiencing the same feelings as myself. Went back to a friends and binge watched It's Always Sunny in Philadelphia'

'With my mates. One of them was proper battered on Xanax: he had taken like 12 tablets and couldn't perform basic activities such as leaving the room to go to the shop. It took him 3 hours to walk across the road. And I basically chilled out watching South Park'

'Took 2 Xanax when I was having relationship troubles and was overthinking situations when trying to sleep so I took the Xanax and fell asleep quickly and had a peaceful, anxiety free sleep'

'Took 5 Xanax and felt like I was floating, couldn't walk properly but I felt fuzzy and warm'

'Took a Valium to calm my thoughts and just felt soothed, more relaxed than I had in a long time'

'Took Valium to sleep well after a late boozy night. It was often very easy to [lose] track of time and this would enable me to ensure I would still keep up with enough sleep. Took Valium to relax me through a large and painful tattoo on my shinbone'

'Fucked my sleeping pattern up after a festival (on account on hammering 1.5 g of MDMA in the space of 3 days), my mate gave me a [Valium] to take before bed to fall asleep at a reasonable hour. Ate it. Fell Asleep. Woke up. Felt FUCKING AMAZING and proper refreshed, best night sleep I ever did have'

'Getting back to campsite at a festival at 7am, sitting on an inflatable chair whilst feeling the effects of taking one Xanax and feeling very waved, light, floaty. Feeling more comfortable than I was before the effects'

'[I] had been at a day festival in London all day, had taken MDMA this evening a terrorist attack happened and all the tubes were closed, I started panicking so my boyfriend gave me 2. I stopped caring/worrying and then just seemed to wake up in bed'

'I had a heavy Saturday night with no sleep and had work Sunday afternoon, I felt really paranoid due to no sleep so I took 2 mg of Xanax and in the space of an hour I felt relaxed and my anxiety had gone which meant I could function properly at work and felt normal (except for being tired)'

'I took 3 x 5 mg Valium for a coach journey from London to Nottingham after a weekend partying in London. I couldn't be asked with the long coach and remember time just flying by where I was so high. I also remember a bender last summer where two friends and I went through 100 Valium (pretty sure they were fake) in three days when I had a free house. We initially started taking them after a night out and before you know it [we've] been smoking weed and taking Valium for three days straight, only moving to get supplies. As you could probably imagine my memories of this three day period are pretty unclear'

'Took 2 Xanax and forgot the convo every now and then, everything seemed to be going by so fast and slow at the same time'

'I took 7 x 1 mg [Xanax] at a gathering I felt happy and warm (like someone had put a blanket over me)'

'I took a Xanax after tripping at a festival when I couldn't sleep. I was seeing flashing images behind my eyelids; when the [Xanax] kicked in I felt tremendously relaxed. Possibly the best physical experience [I] have had in my life so far'

'Took 2 Xanax bars, and had a few drinks at a student bar, remember very little, everyone thought I was very drunk, felt relaxed, dazed, and happy, smoked some weed then went bed, didn't wake up until 5pm the next day'

'I took 2 Valium and chipped my tooth in a club'

'Took 2 Vallies and a load of K and couldn't feel my legs on a night out, ended up sitting in a puddle. Was pretty cool'

'Took 3 Xanax, tried to bump a taxi... almost got arrested'

'Took 4 – 6 [Valium] on my art coursework hand in and ended up delivering 20 pieces of paper one by one from opposing sides of the art department. Following this I snuck back to my halls with a traffic barrier by myself'

'Took them in lectures and fell asleep dribbling on my laptop'

'Took Valium in a friends room after a night out and [I] kept thinking all the square photos on her wall were windows with snow behind'

‘Took 2 Xanax, drank some rum.. Took 2 more, then took some E, ket, coke, and MDMA. I went on a 3 day bender of sesh and generally fucked my life in multiple ways... ended up eating 8 Xans. Moral of the story: stay the fuck away from Xanax but Vallies are sound’

‘Took 20 Valium and 2 Xanax without even realising how much I'd taken. Same dosages as before, I was talking to some friends in my room and I thought 20 minutes had gone by but they were there for 2 hours. I don't remember what I was talking about for 2 hours’

‘After a night cramming and exam at uni with no sleep, I took a Xanax when I got home and within an hour I had fallen asleep in the kitchen with a full cup of tea in one hand whilst in the middle of watching a video on my phone’

‘Had a night staying at a mates then got kicked out. Mixed a lot of alcohol with a lot of clomazepam. Woke up with a nosebleed at Ingatestone instead of my stop. Another time I took a couple of Valium whilst drinking and was told the next day we visited a strip club. I was then told by my friend [I] got two lap dances for 50 pounds each or something. I don't even remember any of it. Feel really silly about that one’

‘I have a rule of only taking 1 Xanax but the one time I broke it I took a couple and was texting my girlfriend the next day, apparently the only thing [I] was replying to her with was 'my showers flooded' cos it had done that day but evidently it seems in my state that was the only bit of relevant information’

‘I remember taking Xanax after a big bender at my friends house party. I had taking a combination of pills alcohol Ket Coke Codeine and I remember taking a Xan before bed and literally feeling so calm and like floaty if I think about it I can still remember the feeling of feeling so chilled out and warm I fell asleep for about 15 hours and missed my bus home. Despite this experience being nice I haven't taken a [Xanax] since as I've seen the effects they have had on people and it's really put me off’

‘Job interview, doubled dosed just before as I still felt nervous, kicked in during the interview and don't remember it very my at all. I didn't get the job’

‘Took 3 mg of Xanax with alcohol and had a complete black out where I made toast in the sink and slept on the bathroom floor’

'Took 7 x 2 mg Xanax, fell into a pond with a friend, then took off all my wet clothes and returned home wearing just a coat. I don't have much memory after falling in the pond. Memory loss of when you take them is the main reason I dislike them'

'Took a couple of 2 mg Xanax on a night out, black out, fell off a bicycle (still have a scar), shoplifted a massive amount of food (Xanax gives me massive munchies) and had a great time clubbing'

'Had 0.5 x 2 mg Xanax on a night out and felt very calm and confident and slightly slowed down at the time, but have little to no memory of the night'

'Had a Valium on an overnight train, sent me puddled. Kept having a dream, waking up, falling asleep and having the same dream, over and over'

'[I took] 1 Xanax after a night out and the combination with alcohol made me black out and not remember the last 6 hours, I woke all my housemates up and left the front door wide open'

'First took them at 14/15 blacked out and felt very comfortable for the following days. My other friends caused havoc and one was found passed out in a park and the one had to go live in Blackpool with his dad. Crazy times'

'Had a really bad experience with Xanax over a period of 2 weeks at most. My mate was addicted, and she recommended [I] take them to help me sleep. Soon I was addicted, taking 4 a day at least. I was unrecognisable ... I was a zombie. I was aggressive. I ruined friendships. I have no memory of it which is the scariest part of it. When [I] came off it [I] was suicidal'

'Nothing is memorable on high dose benzos, I've travelled half way down the country blacked out, broken into Portuguese squats and fallen asleep in a nightclub'

'Taken too many, handful whilst drinking because I didn't feel the effects straight away, my sanity and control slowly deteriorated throughout this period and I woke up in a state and had no idea what had happened, got in trouble with friends, lost money etc. On both Xanax and Diazepam'

'Took 1 Xanax mixed with alcohol the night before and woke up in Germany ([don't] remember getting in the car or anything)'

'Took 1 x 5 mg Xanax and blacked out for 2 days, woke up on my floor thinking it was Saturday but was Monday'

'Took 7 Xanax on a night out and got in a fight which I can only remember because I called someone that night who then told me the next day'

'Took loads of Xanax at carnival. My friend got in a fight with people from a different part of London. Thought I could help. Got punched in the face straight away. But was just out of it doing stupid things annoying my friends being stupid'

'Took some Xanax can't remember how many and severely injured my ankle climbing over a high wall and dropping into a night club, sprain or possible fracture. Was also on alcohol and ketamine'

'Took them at Parklife to counteract the negative effects of acid, stopped me tripping which was shit but me and my mate were just wandering round without a care in the world, don't remember much lol probs wouldn't do it again'

Appendix 44: Image of presumed Valium tablet (V1 – anomaly)

Appendix 45: Image of presumed Valium tablet

Appendix 46: Unknown 'Valium' weight and description

Name of sample	Previous name	Features	Weight in grams	2/10 weight in grams
V1	361	Blue pill - 'ROCHE 10'	0.1182	0.0235
V2	710	Blue pill - 'MSJ'	0.0542	0.0109
V3	710	Blue pill - 'MSJ'	0.0541	0.0107
V4	710	Blue pill - 'MSJ'	0.0661	0.0134
V5	710	Blue pill - 'MSJ'	0.0577	0.0112
V6	710	Blue pill - 'MSJ'	0.0596	0.0119
V7	710	Blue pill - 'MSJ'	0.0533	0.0106
V8	710	Blue pill - 'MSJ'	0.0592	0.0116
V9	710	Blue pill - 'MSJ'	0.056	0.0111
V10	710	Blue pill - 'MSJ'	0.055	0.011
V11	710	Blue pill - 'MSJ'	0.0593	0.0117
V12	710	Blue pill - 'MSJ'	0.0598	0.012
V13	710	Blue pill - 'MSJ'	0.0545	0.0109
V14	710	Blue pill - 'MSJ'	0.0575	0.0111
V15	710	Blue pill - 'MSJ'	0.0556	0.011
V16	710	Blue pill - 'MSJ'	0.0528	0.0105
V17	710	Blue pill - 'MSJ'	0.0537	0.0107
V18	710	Blue pill - 'MSJ'	0.0562	0.0111
V19	710	Blue pill - 'MSJ'	0.0563	0.0111
V20	710	Blue pill - 'MSJ'	0.0625	0.0123
V21	710	Blue pill - 'MSJ'	0.0663	0.0134
V22	710	Blue pill - 'MSJ'	0.0626	0.0126
V23	710	Blue pill - 'MSJ'	0.062	0.0124
V24	710	Blue pill - 'MSJ'	0.066	0.0135
V25	710	Blue pill - 'MSJ'	0.0668	0.0136
V26	710	Blue pill - 'MSJ'	0.0638	0.0128
V27	710	Blue pill - 'MSJ'	0.0674	0.0136
V28	710	Blue pill - 'MSJ'	0.0624	0.0126
V29	710	Blue pill - 'MSJ'	0.0619	0.0122

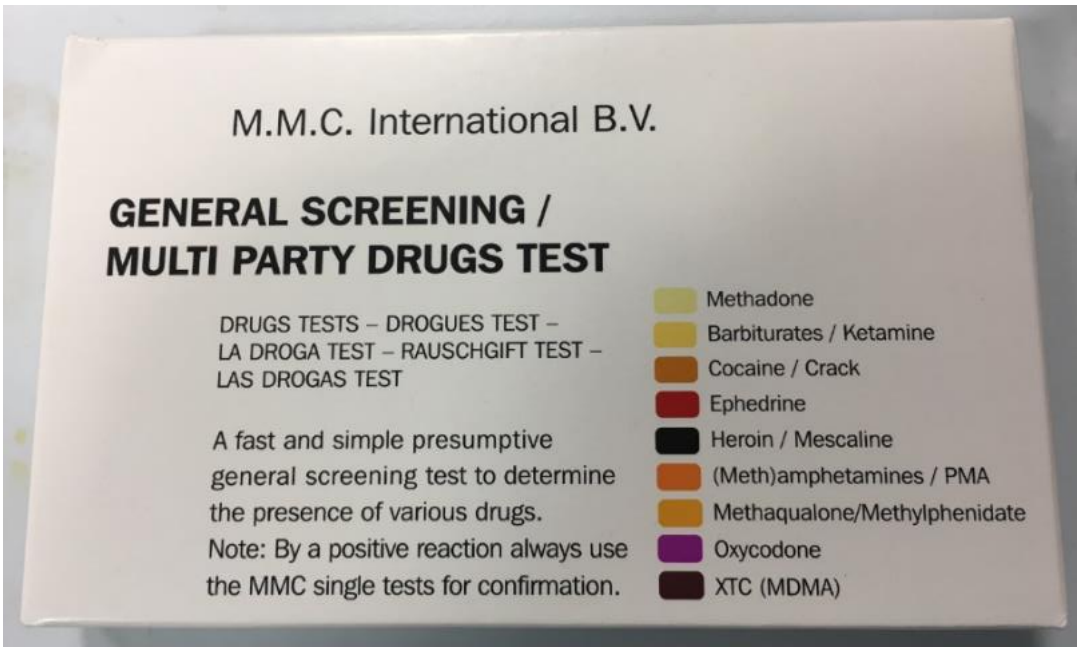
Appendix 47: Image of presumed Xanax bar

Appendix 48: Image of presumed Xanax tablet (X26)

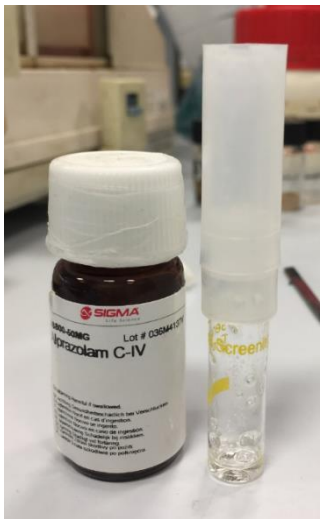
Appendix 49: Unknown 'Xanax' weight and description

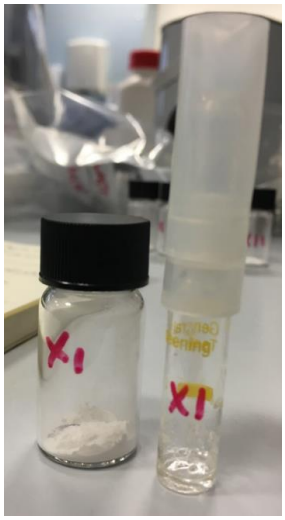
Name of sample	Previous name	Features	Weight in grams	1/2 weight in grams
X1	53	Powder	0.5135	0.2575
X2	B109	Full Xanax bar	0.2966	0.1341
X3	73	Powder	0.3365	0.1582
X4	550	Powder	0.9146	0.4421
X5	559D	Full Xanax bar	0.2382	0.1173
X6	555A	Powder	0.044	0.0221
X7	559E	Powder	0.1685	0.0845
X8	559B	Full Xanax bar	0.2382	0.1195
X9	555B	Powder	0.0451	0.0228
X10	558A	Full Xanax bar	0.2301	0.1158
X11	559C	Full Xanax bar	0.2231	0.1115
X12	B104	Full Xanax bar	0.2533	0.1261
X13	B102	Full Xanax bar	0.2478	0.1238
X14	B112	Full Xanax bar	0.2448	0.1226
X15	559A	Powder	0.122	0.0612
X16	B115	Half a Xanax bar	0.1	0.0501
X17	B103	Full Xanax bar	0.2719	0.135
X18	B114	Full Xanax bar	0.2533	0.1266
X19	B110	Full Xanax bar	0.2535	0.1269
X20	B105	Full Xanax bar	0.251	0.1258
X21	B101	Full Xanax bar	0.2467	0.1142
X22	B107	Full Xanax bar	0.2582	0.1291
X23	B106	Full Xanax bar	0.2607	0.1308
X24	B108	Full Xanax bar	0.2521	0.126
X25	B113	Full Xanax bar	0.2605	0.1301
X26	B151	Blue tablet - 'UPJOHN 90'	0.1145	0.057
X27	B111	Full Xanax bar	0.237	0.1188
X28	226	Full Xanax bar - small	0.2087	0.1026
X29	227	Full Xanax bar - small	0.2243	0.1093

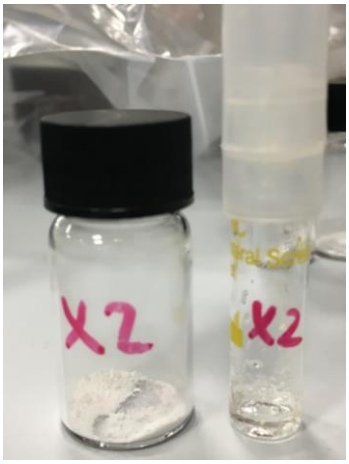
Appendix 50: Image of presumptive test packaging



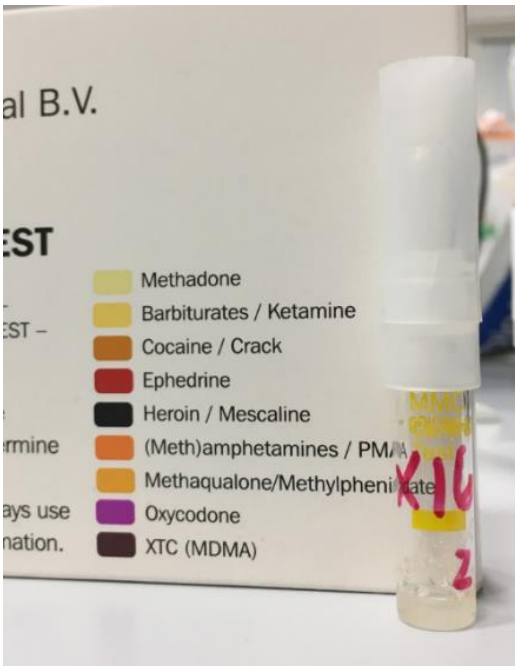
Appendix 51: Images of initial results from presumptive test







Appendix 52: Image of X16 colour change after 5 minutes



Appendix 53: NMR results table

Sample name	Description pre NMR (from GC-MS)	MG and Solvent	Description after NMR	Notes
Alprazolam reference		Assume 5-10mg	**DMSO:** Class: NPS – Benzodiazepines Compound: Alprazolam Match score: 0.997	Used the last bit of the reference powder hence small quantity
Diazepam reference		10mg	**DMSO:** Class: NPS – Benzodiazepines Compound: Diazepam Match score: 0.999	
X1	Alprazolam – biggest peak amongst samples	20mg 20mg	**DMSO:** Class: Cutting Agent Compound: Alpha-D-Lactose.H2O Match score: 0.994 **Acetonitrile:** Possible unknowns Class: NPS – Synthetic Cannabinoids Compound: 5F-AKB-48 Match score: 0.835	Not very soluble at the concentration required. (in acetonitrile) Needed more of the substance for it to be detected however that led to

				solubility issues.
X3	Alprazolam – big peak	20mg	**DMSO:** Class: Cutting Agent Compound: Alpha-D-Lactose.H2O Match score: 0.980	
X9	Alprazolam – small peak	10mg 10mg	**DMSO:** Class: Cutting Agent Compound: alpha-D-Lactose.H20 Match score: 0.986 **Acetonitrile:** Possible unknowns Class: NPS – Synthetic Cannabinoids Compound: 5F-AKB-48 Class: NPS – Atypical Diphenidines Compound: 2 2-dimethyldiphenidine Match score: 0.820	
X28	Alprazolam – small peak	20mg 20mg	**DMSO:** Class: Cutting Agent Compound: alpha-D-Lactose.H20 Match score: 0.991 **Acetonitrile:** Possible unknowns Class: NPS – Synthetic Cannabinoids Compound: 5F-AKB-48 Class: NPS – Atypical Diphenidines Compound: 2 2-dimethyldiphenidine Match score: 0.835	
X29	Alprazolam – small peak	20mg 20mg	**DMSO:** Class: Cutting Agent Compound: alpha-D-Lactose.H20 Match score: 0.991 **Acetonitrile:** Class: NPS – Synthetic Cannabinoids Compound: 5F-AKB-48 Match score: 0.852	
X4	No Alprazolam 25.9% match with Triazolam	20mg 20mg	**DMSO:** Class: NPS Steroids Compound: Nadrolone Decante Match score: 0.903 **Acetonitrile:** Possible unknowns	

			Class: NPS – Synthetic Cannabinoids Compound: 5F-AKB-48 Class: NPS – AtypicalDiphenidines Compound: 2 2-dimethyldiphenidine Match score: 0.830	
X16	No Alprazolam 91% match with Zolpidem	20mg 20mg	**DMSO:** Nothing detected **Acetonitrile:** Possible unknowns Class: Narcotic Compound: Bupropion Class: Narcotic Compound: phencyclidine HCl Match score: 0.788	DMSO: tried to filter but it exploded. Not much liquid for the NMR. Could be the reason for nothing being detected
X6	Nothing detected	*9mg 10mg	**DMSO:** Class: Cutting Agent Compound: alpha-D-Lactose.H20 Match score: 0.981 **Acetonitrile:** Possible unknowns Class: NPS – Synthetic Cannabinoids Compound: 5F-AKB-48 Class: NPS – Atypical Diphenidines Compound: 2 2-dimethyldiphenidine Match score: 0.818	Only 9mg used for the DMSO test
X17	Nothing detected	20mg 20mg	**DMSO:** Class: Cutting Agent Compound: alpha-D-Lactose.H20 Match score: 0.995 **Acetonitrile:** Possible unknowns Class: NPS – Synthetic Cannabinoids Compound: 5F-AKB-48 Class: NPS – Atypical Diphenidines Compound: 2 2-dimethyldiphenidine Match score: 0.834	
X30	Quetiapine	20mg	**DMSO:** Class: Pharmaceutical Compound: Meperidine HCl (pethidine) Match score: 0.849	Did not dissolve well in both solvents

		20mg	**Acetonitrile:** Class: NPS – Synthetic Cannabinoids Compound: 5F-AKB-48 Match score: 0.865	
X31	Quetiapine	20mg 20mg	**DMSO:** Possible unknowns Class: Pharmaceutical Compound: Quetiapine Class: Cutting Agent Compound: alpha-D-Lactose.H2O Match score: 0.812 **Acetonitrile:** Possible unknowns Class: Narcotic Compound: Bupropion Class: NPS – Piperazines Compound: 1-(2-trifluoromethylphenyl)piperazine Match score: 0.827	Did not dissolve well in both solvents – Worst of all Quetiapine samples
X32	Quetiapine	20mg 20mg	**DMSO:** Class: Pharmaceutical Compound: Quetiapine Match score: 0.855 **Acetonitrile:** Class: NPS – Synthetic Cannabinoids Compound: 5F-AKB-48 Class: Narcotic Compound: Phencyclidine HCl Match score: 0.860	Did not dissolve well in both solvents
V1	Odd one out. Nothing detected on GC-MS	20mg 20mg	**DMSO:** Nothing detected **Acetonitrile:** Possible unknowns Class: NPS – Synthetic Cannabinoids Compound: 5F-AKB-48 Class: NPS – AtypicalDiphenidines Compound: 2 2-dimethyldiphenidine Match score: 0.832	
V2		10mg	**DMSO:** Class: Cutting Agent Compound: Alpha-D-Lactose.H2O Class: Narcotic Compound: Phencyclidine HCl Match score: 0.915	

V3		10mg	**DMSO:** Class: Cutting Agent Compound: Alpha-D-Lactose.H2O Class: Narcotic Compound: Phencyclidine HCl Match score: 0.911	
V4		15mg	**DMSO:** Class: Cutting Agent Compound: Alpha-D-Lactose.H2O Class: Narcotic Compound: Phencyclidine HCl Match score: 0.909	
V5		15mg	**DMSO:** Class: Cutting Agent Compound: Alpha-D-Lactose.H2O Class: Narcotic Compound: Phencyclidine HCl Match score: 0.915	
V6		15mg	**DMSO:** Class: Cutting Agent Compound: Alpha-D-Lactose.H2O Class: Narcotic Compound: Phencyclidine HCl Match score: 0.913	

Appendix 54: Integrated area ratios of 'Valium' samples

	Eicosane integration		Sample integration		Integrated area ratio (IAR)													
Name of sample	1	2	1	2	1	2					2/10 weight	Origonal weight	IAR 2	X value	x 2	/ 2/10ths we	* orig weigl	/ 1000
V1	No peak									v1	23.5	118.2	n/a	n/a	n/a	n/a	n/a	n/a
V2	686026.59		269831		0.393					v2	10.9	54.2						
V3	632651.37	556716.1	339320.54	296868.99	0.536	0.533				v3	10.7	54.1	0.533	71.5465	143.093	13.373183	286.1861	26.7464
V4	548696.38	528256.4	292562.05	282103.27	0.533	0.534				v4	13.4	66.1	0.534	71.6068	143.214	10.687575	286.427	21.3752
V5	607436.38	520663.2	262281.37	219521.27	0.432	0.422		y=0.0129x - 0.3897		v5	11.2	57.7	0.422	62.8929	125.786	11.230877	251.5716	22.4618
V6	568659.31	578880.5	214374.73	213504.6	0.377	0.369				v6	11.9	59.6	0.369	58.8003	117.601	9.8823958	235.201	19.7648
V7	571394.7	567330.3	205154.44	204261.9	0.359	0.360		**x=(y+0.3897)/0.0129**		v7	10.6	53.3	0.360	58.1194	116.239	10.965928	232.4777	21.9319
V8	655643.26	527063.3	243301.82	194904.48	0.371	0.370				v8	11.6	59.2	0.370	58.8755	117.751	10.15094	235.5018	20.3019
V9	597194.63	533588.1	224311.1	198749.02	0.376	0.372				v9	11.1	56	0.372	59.0834	118.167	10.645666	236.3338	21.2913
V10	587873.21	510888.8	183428.86	165060.51	0.312	0.323				v10	11	55	0.323	55.2547	110.509	10.0463	221.0186	20.0926
V11	558886.03	591460.6	172116.37	171530.4	0.308	0.290				v11	11.7	59.3	0.290	52.6908	105.382	9.0069775	210.7633	18.014
V12	569696.39	535081.8	196786.64	187630.8	0.345	0.351				v12	12	59.8	0.351	57.3921	114.784	9.5653509	229.5684	19.1307
V13	451497.41	450135.7	163405.01	170396.52	0.362	0.379				v13	10.9	54.5	0.379	59.5539	119.108	10.927314	238.2154	21.8546
V14	516223.61	502012.9	203643.32	202174.29	0.394	0.403				v14	11.1	57.5	0.403	61.4285	122.857	11.068193	245.7139	22.1364
V15	481524.89	443148.1	188980.34	175631.88	0.392	0.396				v15	11	55.6	0.396	60.9324	121.865	11.078615	243.7295	22.1572
V16	480478.75	454569.1	154506.93	152883.64	0.322	0.336				v16	10.5	52.8	0.336	56.2811	112.562	10.720215	225.1245	21.4404
V17	517747.33	414160.9	166668.67	131086	0.322	0.317				v17	10.7	53.7	0.317	54.7449	109.49	10.2327	218.9798	20.4654
V18	444655.74	451775.5	180254.48	185122.59	0.405	0.410				v18	11.1	56.2	0.410	61.9742	123.948	11.166517	247.8967	22.333
V19	418818.69	474091.4	144372.3	168695.32	0.345	0.356				v19	11.1	56.3	0.356	57.7929	115.586	10.413139	231.1717	20.8263
V20	199267.51	239677.4	49583.44	54943.35	0.249	0.229				v20	12.3	62.5	0.229	47.9797	95.9595	7.8015849	191.919	15.6032
V21	236263.21	2302266	73309.44	72137.05	0.310	0.031				v21	13.4	66.3	0.031	32.6382	65.2764	4.8713764	130.5529	9.74275
V22	285595.16	279386.1	74009.98	72950.71	0.259	0.261				v22	12.6	62.6	0.261	50.4504	100.901	8.0080068	201.8018	16.016
V23	292289.96	301448.1	64848.74	72104.98	0.222	0.239				v23	12.4	62	0.239	48.7516	97.5032	7.8631578	195.0063	15.7263
V24	293617.26	327504.8	87310.5	90563.85	0.297	0.277				v24	13.5	66	0.277	51.6455	103.291	7.6511829	206.5819	15.3024
V25	293931.6	292182.6	87487.37	87930.3	0.298	0.301				v25	13.6	66.8	0.301	53.5382	107.076	7.8732674	214.1529	15.7465
V26	316149.79	336576.7	85070.08	89732.27	0.269	0.267				v26	12.8	63.8	0.267	50.8762	101.752	7.949403	203.5047	15.8988
V27	359344.28	326378	90306.28	87417.33	0.251	0.268				v27	13.6	67.4	0.268	50.9721	101.944	7.4959043	203.8886	14.9918
V28	343856.12	371428.7	92146.38	99675.8	0.268	0.268				v28	12.6	62.4	0.268	51.0122	102.024	8.0971802	204.0489	16.1944
V29	335664.45	316792.5	78094.28	77251.03	0.233	0.244				v29	12.2	61.9	0.244	49.1127	98.2254	8.0512613	196.4508	16.1025

Appendix 55: Integrated area ratios of 'Xanax' samples

	Eicosane integration			Sample integration			Integrated area ratio (IAR)			
Name of sample	1	2	3	1	2	3	1	2	3	NOTES
X1	432842.39	375763.54	375993.96	402658.19	340635.76	346131.84	0.930	0.907	0.921	Biggest peak of all samples
X2	356626.28	348182.73	344582.97	70177.42	68922.52	66141.48	0.197	0.198	0.192	Small peak
X3	316370.1	298212.11	299974.46	146134.19	140853.47	147524.7	0.462	0.472	0.492	
X4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No Alprazolam detected and 559 match / 25.9% probability with Triazolam @ 13.33 mins
X5	367204.59	339216.51	306297.23	116842.8	114329.41	98947.74	0.318	0.337	0.323	
X6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Nothing detected
X7	184921.4	166357.68	176667.28	49210.9	42067.97	45337.99	0.266	0.253	0.257	Very small peak
X8	167017.89	179834.74	159288.27	71844.95	78339.32	68585.75	0.430	0.436	0.431	
X9	Very small peak - only a 473 match / 54.2 probability with alprazolam									Very little/ almost undetectable levels of Alprazolam found
X10	185704.84	180345.52	160351.92	45098.17	45688.58	39973.61	0.243	0.253	0.249	Small peak
X11	183489.25	160379.54	169966.64	76709.07	69230.44	71726.76	0.418	0.432	0.422	
X12	164848.39	152572.61	151440.6	49010.31	45054.64	45344.97	0.297	0.295	0.299	Small peak
X13	137506.47	151684.48	149141.66	41244.13	42795.38	43891.8	0.300	0.282	0.294	
X14	166128.53	158383.14	157267.69	34627.69	34861.83	33603.93	0.208	0.220	0.214	Very small peak
X15	177471.25	178002.02	197163.61	35521.06	34681.8	39600.33	0.200	0.195	0.201	
X16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No Alprazolam detected and 902 match / 91.9% probability with Zolpidem @ 11.863 mins
X17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Nothing detected
X18	159675.71	160252.83	135526.63	53636.42	51437.36	47281.76	0.336	0.321	0.349	
X19	177811.08	176746.6	211920.37	41500.16	40328.55	49173.49	0.233	0.228	0.232	Small peak
X20	160142.78	153538.28	162516.43	42027.35	39398.76	40672.18	0.262	0.257	0.250	Small peak
X21	136949.78	176020.12	140666.65	31373.1	42705.63	32575.58	0.229	0.243	0.232	Small peak
X22	152008.15	142125.31	156395.83	53860.37	50380.65	57024.9	0.354	0.354	0.365	
X23	189948.13	150256.65	169067.17	64897.22	53517.44	58519.82	0.342	0.356	0.346	Small peak
X24	172202.58	146027.47	146829.98	57746.95	49625.93	54115.1	0.335	0.340	0.369	**Cannot detect anything under 3.15**
X25	128282.92	139870.02	125215.86	45704.33	51748.36	45372.64	0.356	0.370	0.362	
X26	117018.58	138651.02	105777.12	32479.16	31205.09	28116.86	0.278	0.225	0.266	Very small peak
X27	135762	149813.1	142917.3	44979.01	43922.69	41096.34	0.331	0.293	0.288	Small peak
X28	168883.56	182011.01		60360.5	63544.83		0.357	0.349		New batch
X29	177811.33	203958.56		61138.62	72887.6		0.344	0.357		New batch

x= y+0.1341/0.0095

y=0.0095x-0.1341

	IAR 1	IAR 2	IAR 3	standard deviation	relative standard deviation
X1	112.0384366	109.538554	111.0187571	1.256991172	#REF!
X2	34.82962145	34.95255557	34.32067961	0.335012891	#REF!
X3	62.7377873	63.83436412	65.88324924	1.596576637	#REF!
X4	No Alprazolam detected				
X5	47.61003884	49.59364619	48.12050959	1.030000804	#REF!
X6	No Alprazolam detected				
X7	Peak too small				
X8	59.3961263	59.9703569	59.43960793	0.319720163	#REF!
X9	Peak too small				

Appendix 56a: Raw SPSS data: Frequency tables

Q1 Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-21	422	70.9	70.9	70.9
	22-25	127	21.3	21.3	92.3
	26-30	19	3.2	3.2	95.5
	31-40	11	1.8	1.8	97.3
	41+	16	2.7	2.7	100.0
	Total	595	100.0	100.0	

Q2 Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	326	54.8	55.3	55.3
	Female	263	44.2	44.6	99.8
	Transgender	1	.2	.2	100.0
	Total	590	99.2	100.0	
Missing	Missing	5	.8		
Total		595	100.0		

Q3 Sexuality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Heterosexual/ straight	498	83.7	83.7	83.7
	Homosexual/ gay/ lesbian	18	3.0	3.0	86.7
	Bisexual	68	11.4	11.4	98.2
	A sexual	2	.3	.3	98.5
	I'd rather not say	7	1.2	1.2	99.7
	Other	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q4 Ethnicity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	White	529	88.9	88.9	88.9
	Black	5	.8	.8	89.7
	Asian	14	2.4	2.4	92.1
	Mixed	40	6.7	6.7	98.8
	Chinese	2	.3	.3	99.2
	Arab	2	.3	.3	99.5

	Hispanic	1	.2	.2	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q5 Home

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	South East	33	5.5	5.5	5.5
	London	100	16.8	16.8	22.4
	North West	170	28.6	28.6	50.9
	East of England	26	4.4	4.4	55.3
	West Midlands	26	4.4	4.4	59.7
	South West	85	14.3	14.3	73.9
	Yorkshire and the Humber	64	10.8	10.8	84.7
	East Midlands	35	5.9	5.9	90.6
	North East	18	3.0	3.0	93.6
	Scotland	25	4.2	4.2	97.8
	Ireland	5	.8	.8	98.7
	Wales	4	.7	.7	99.3
	I'd rather not say	4	.7	.7	100.0
	Total	595	100.0	100.0	

Q6 Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Full/ part-time student	492	82.7	82.7	82.7
	Employed	89	15.0	15.0	97.6
	Unemployed	7	1.2	1.2	98.8
	Other	3	.5	.5	99.3
	Missing	4	.7	.7	100.0
	Total	595	100.0	100.0	

Q7 - Valium

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	499	83.9	83.9	83.9
	No	96	16.1	16.1	100.0
	Total	595	100.0	100.0	

Q7 - Xanax

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	481	80.8	80.8	80.8
	No	114	19.2	19.2	100.0
	Total	595	100.0	100.0	

Q7 - Klonopin

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	61	10.3	10.3	10.3
	No	534	89.7	89.7	100.0
	Total	595	100.0	100.0	

Q7 - Ativan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	47	7.9	7.9	7.9
	No	548	92.1	92.1	100.0
	Total	595	100.0	100.0	

Q7 - Estazolam

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	36	6.1	6.1	6.1
	No	559	93.9	93.9	100.0
	Total	595	100.0	100.0	

Q7 - Etizolam

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	30	5.0	5.0	5.0
	No	565	95.0	95.0	100.0
	Total	595	100.0	100.0	

Q7 - Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	31	5.2	5.2	5.2
	No	564	94.8	94.8	100.0
	Total	595	100.0	100.0	

Q8 - Xanax

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	313	52.6	52.6	52.6
	No	282	47.4	47.4	100.0
	Total	595	100.0	100.0	

Q8 - Valium

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	273	45.9	45.9	45.9
	No	322	54.1	54.1	100.0
	Total	595	100.0	100.0	

Q8 - Not recently

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	181	30.4	30.4	30.4
	No	414	69.6	69.6	100.0
	Total	595	100.0	100.0	

Q8 – Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	40	6.7	6.7	6.7
	No	555	93.3	93.3	100.0
	Total	595	100.0	100.0	

Q9 - Preferred benzo

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Valium	276	46.4	46.4	46.4
	Xanax	265	44.5	44.5	90.9
	Other	31	5.2	5.2	96.1
	None - dislike them all AND no preference	15	2.5	2.5	98.7
	Missing	8	1.3	1.3	100.0
	Total	595	100.0	100.0	

Q11 - Sleep

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	330	55.5	55.6	55.6
	No	264	44.4	44.4	100.0
	Total	594	99.8	100.0	
Missing	System	1	.2		
Total		595	100.0		

Q11anxietycombined

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	195	32.8	32.8	32.8
	No	400	67.2	67.2	100.0
	Total	595	100.0	100.0	

Q11 - High

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	368	61.8	62.0	62.0
	No	226	38.0	38.0	100.0
	Total	594	99.8	100.0	
Missing	System	1	.2		
Total		595	100.0		

Q11 - Counteract stim

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	369	62.0	62.1	62.1
	No	225	37.8	37.9	100.0
	Total	594	99.8	100.0	
Missing	System	1	.2		
Total		595	100.0		

Q12 - Frequency of use

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Daily	26	4.4	4.4	4.4
	Weekly	91	15.3	15.3	19.7
	Fortnightly	84	14.1	14.1	33.8
	Monthly	88	14.8	14.8	48.6
	Every few months	191	32.1	32.1	80.7
	Rarely	49	8.2	8.2	88.9
	Not for a while	26	4.4	4.4	93.3
	Binge	11	1.8	1.8	95.1
	Whenever I need to	17	2.9	2.9	98.0
	Other	7	1.2	1.2	99.2
	Missing	5	.8	.8	100.0
	Total	595	100.0	100.0	

Q13 - Valium

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	125	21.0	21.0	21.0
	2	180	30.3	30.3	51.3
	3	69	11.6	11.6	62.9
	4	31	5.2	5.2	68.1
	5	28	4.7	4.7	72.8
	6-10	16	2.7	2.7	75.5
	Over 10	15	2.5	2.5	78.0
	Missing	35	5.9	5.9	83.9
	Not applicable	96	16.1	16.1	100.0
	Total	595	100.0	100.0	

Q13 - Xanax

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	220	37.0	37.0	37.0
	2	147	24.7	24.7	61.7
	3	42	7.1	7.1	68.7
	4	21	3.5	3.5	72.3
	5	11	1.8	1.8	74.1
	Over 10	1	.2	.2	74.3
	1/2 a Xanax bar	14	2.4	2.4	76.6
	Missing	25	4.2	4.2	80.8
	Not applicable	114	19.2	19.2	100.0
	Total	595	100.0	100.0	

Q15 - Swallow

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	590	99.2	99.2	99.2
	No	4	.7	.7	99.8
	Missing	1	.2	.2	100.0
	Total	595	100.0	100.0	

Q15 - Snort

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	96	16.1	16.1	16.1
	No	498	83.7	83.7	99.8
	Missing	1	.2	.2	100.0
	Total	595	100.0	100.0	

Q15 - Inject

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	1	.2	.2	.2
	No	593	99.7	99.7	99.8
	Missing	1	.2	.2	100.0
	Total	595	100.0	100.0	

Q15 - Sublingually

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	10	1.7	1.7	1.7
	No	584	98.2	98.2	99.8
	Missing	1	.2	.2	100.0
	Total	595	100.0	100.0	

Q15 - Chew it

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	1	.2	.2	.2
	No	593	99.7	99.7	99.8
	Missing	1	.2	.2	100.0
	Total	595	100.0	100.0	

Q15 - DissolveInDrink

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	4	.7	.7	.7
	No	591	99.3	99.3	100.0
	Total	595	100.0	100.0	

Q17 - Alcohol

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	590	99.2	99.2	99.2
	No	3	.5	.5	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q17 - Tobacco

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	560	94.1	94.1	94.1
	No	33	5.5	5.5	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q17 - Cannabis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	571	96.0	96.0	96.0
	No	22	3.7	3.7	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q17MDMAcombi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	545	91.6	91.6	91.6
	No	48	8.1	8.1	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q17 - Cocaine

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	524	88.1	88.1	88.1
	No	69	11.6	11.6	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q17 - Ketamine

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	520	87.4	87.4	87.4
	No	73	12.3	12.3	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q17Hallucinogens

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	436	73.3	73.3	73.3
	No	157	26.4	26.4	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q17 - Amphetamines

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	365	61.3	61.3	61.3
	No	228	38.3	38.3	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q17 - Modafinil/ Ritalin

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	317	53.3	53.3	53.3
	No	276	46.4	46.4	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q17opiatescrack

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	155	26.1	26.1	26.1
	No	438	73.6	73.6	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q17 - Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	72	12.1	12.1	12.1
	No	521	87.6	87.6	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q18 - Alcohol

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	395	66.4	66.4	66.4
	No	200	33.6	33.6	100.0
	Total	595	100.0	100.0	

Q18 - Tobacco

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	268	45.0	45.0	45.0
	No	327	55.0	55.0	100.0
	Total	595	100.0	100.0	

Q18 - Cannabis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	80	13.4	13.4	13.4
	No	515	86.6	86.6	100.0
	Total	595	100.0	100.0	

Q18MDMAcombi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	208	35.0	35.0	35.0
	No	387	65.0	65.0	100.0
	Total	595	100.0	100.0	

Q18 - Cocaine

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	189	31.8	31.8	31.8
	No	406	68.2	68.2	100.0
	Total	595	100.0	100.0	

Q18 - Ketamine

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	198	33.3	33.3	33.3
	No	397	66.7	66.7	100.0
	Total	595	100.0	100.0	

Q18Hallucinogens

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	83	13.9	13.9	13.9
	No	512	86.1	86.1	100.0
	Total	595	100.0	100.0	

Q18 - Amphetamines

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	59	9.9	9.9	9.9
	No	536	90.1	90.1	100.0
	Total	595	100.0	100.0	

Q18 - Modafinil/ Ritalin

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	27	4.5	4.5	4.5
	No	568	95.5	95.5	100.0
	Total	595	100.0	100.0	

Q18Opiatescrack

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	7	1.2	1.2	1.2
	No	588	98.8	98.8	100.0
	Total	595	100.0	100.0	

Q18 - Nothing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	144	24.2	24.2	24.2
	No	451	75.8	75.8	100.0
	Total	595	100.0	100.0	

Q19 - prescribed by NHS or psychiatrist

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	75	12.6	12.6	12.6
	No	518	87.1	87.1	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q19 – Non-prescribed but diverted

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	71	11.9	11.9	11.9
	No	522	87.7	87.7	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q19 - Friend

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	316	53.1	53.1	53.1
	No	277	46.6	46.6	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q19 - Family

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	22	3.7	3.7	3.7
	No	571	96.0	96.0	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q19 - Work/ study colleague

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	22	3.7	3.7	3.7
	No	571	96.0	96.0	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q19 - Clearweb

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	27	4.5	4.5	4.5
	No	566	95.1	95.1	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q19 - Darkweb

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	172	28.9	28.9	28.9
	No	421	70.8	70.8	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q19 - Dealer

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	340	57.1	57.1	57.1
	No	253	42.5	42.5	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q19 - Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	22	3.7	3.7	3.7
	No	571	96.0	96.0	99.7
	Missing	2	.3	.3	100.0
	Total	595	100.0	100.0	

Q20 - Only benzos

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	108	18.2	18.2	18.2
	No	159	26.7	26.7	44.9
	Missing	75	12.6	12.6	57.5
	Not applicable	253	42.5	42.5	100.0
	Total	595	100.0	100.0	

Q20 - Cannabis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	90	15.1	15.1	15.1
	No	177	29.7	29.7	44.9
	Missing	75	12.6	12.6	57.5
	Not applicable	253	42.5	42.5	100.0
	Total	595	100.0	100.0	

Q20 - MDMA (crystal/powder)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	86	14.5	14.5	14.5
	No	181	30.4	30.4	44.9
	Missing	75	12.6	12.6	57.5
	Not applicable	253	42.5	42.5	100.0
	Total	595	100.0	100.0	

Q20 - MDMA (pills)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	98	16.5	16.5	16.5
	No	169	28.4	28.4	44.9
	Missing	75	12.6	12.6	57.5
	Not applicable	253	42.5	42.5	100.0
	Total	595	100.0	100.0	

Q20 - Cocaine

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	94	15.8	15.8	15.8
	No	173	29.1	29.1	44.9
	Missing	75	12.6	12.6	57.5
	Not applicable	253	42.5	42.5	100.0
	Total	595	100.0	100.0	

Q20 - Ketamine

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	113	19.0	19.0	19.0
	No	154	25.9	25.9	44.9
	Missing	75	12.6	12.6	57.5
	Not applicable	253	42.5	42.5	100.0
	Total	595	100.0	100.0	

Q20 - LSD/ Acid

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	27	4.5	4.5	4.5
	No	240	40.3	40.3	44.9
	Missing	75	12.6	12.6	57.5
	Not applicable	253	42.5	42.5	100.0
	Total	595	100.0	100.0	

Q20 - Magic Mushrooms

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	17	2.9	2.9	2.9
	No	250	42.0	42.0	44.9
	Missing	75	12.6	12.6	57.5
	Not applicable	253	42.5	42.5	100.0
	Total	595	100.0	100.0	

Q20 - Amphetamines

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	15	2.5	2.5	2.5
	No	252	42.4	42.4	44.9
	Missing	75	12.6	12.6	57.5
	Not applicable	253	42.5	42.5	100.0
	Total	595	100.0	100.0	

Q20 - Modafinil/ Ritalin

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	17	2.9	2.9	2.9
	No	250	42.0	42.0	44.9
	Missing	75	12.6	12.6	57.5
	Not applicable	253	42.5	42.5	100.0
	Total	595	100.0	100.0	

Q20 - Heroin and other opiates

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	4	.7	.7	.7
	No	263	44.2	44.2	44.9
	Missing	75	12.6	12.6	57.5
	Not applicable	253	42.5	42.5	100.0
	Total	595	100.0	100.0	

Q20 - Crack Cocaine

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	2	.3	.3	.3
	No	265	44.5	44.5	44.9
	Missing	75	12.6	12.6	57.5
	Not applicable	253	42.5	42.5	100.0
	Total	595	100.0	100.0	

Q21Valdonotpay

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	135	22.7	22.7	22.7
	No	330	55.5	55.5	78.2
	missing	130	21.8	21.8	100.0
	Total	595	100.0	100.0	

Q21Val50p

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	87	14.6	14.6	14.6
	No	378	63.5	63.5	78.2
	missing	130	21.8	21.8	100.0
	Total	595	100.0	100.0	

Q21Val£1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	142	23.9	23.9	23.9
	No	323	54.3	54.3	78.2
	missing	130	21.8	21.8	100.0
	Total	595	100.0	100.0	

Q21Val£1.50

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	35	5.9	5.9	5.9
	No	430	72.3	72.3	78.2
	missing	130	21.8	21.8	100.0
	Total	595	100.0	100.0	

Q21Val£2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	48	8.1	8.1	8.1
	No	417	70.1	70.1	78.2
	missing	130	21.8	21.8	100.0
	Total	595	100.0	100.0	

Q21Val£3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	14	2.4	2.4	2.4
	No	451	75.8	75.8	78.2
	missing	130	21.8	21.8	100.0
	Total	595	100.0	100.0	

Q21Val£4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	4	.7	.7	.7
	No	461	77.5	77.5	78.2
	missing	130	21.8	21.8	100.0
	Total	595	100.0	100.0	

Q21ValOther

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	18	3.0	3.0	3.0
	No	577	97.0	97.0	100.0
	Total	595	100.0	100.0	

Q21Xandonotpay

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	60	10.1	10.1	10.1
	No	364	61.2	61.2	71.3
	missing	171	28.7	28.7	100.0
	Total	595	100.0	100.0	

Q21Xan50p

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	48	8.1	8.1	8.1
	No	376	63.2	63.2	71.3
	missing	171	28.7	28.7	100.0
	Total	595	100.0	100.0	

Q21Xan£1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	91	15.3	15.3	15.3
	No	333	56.0	56.0	71.3
	missing	171	28.7	28.7	100.0
	Total	595	100.0	100.0	

Q21Xan£1.50

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	56	9.4	9.4	9.4
	No	368	61.8	61.8	71.3
	missing	171	28.7	28.7	100.0
	Total	595	100.0	100.0	

Q21Xan£2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	141	23.7	23.7	23.7
	No	283	47.6	47.6	71.3
	missing	171	28.7	28.7	100.0
	Total	595	100.0	100.0	

Q21Xan£3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	49	8.2	8.2	8.2
	No	375	63.0	63.0	71.3
	missing	171	28.7	28.7	100.0
	Total	595	100.0	100.0	

Q21Xan£4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	13	2.2	2.2	2.2
	No	411	69.1	69.1	71.3
	missing	171	28.7	28.7	100.0
	Total	595	100.0	100.0	

Q21XanOther

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	14	2.4	2.4	2.4
	No	410	68.9	68.9	71.3
	missing	171	28.7	28.7	100.0
	Total	595	100.0	100.0	

Q22 - How many purchase

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5	182	30.6	30.6	30.6
	6-10	118	19.8	19.8	50.4
	11-20	77	12.9	12.9	63.4
	21-50	76	12.8	12.8	76.1
	51+	55	9.2	9.2	85.4
	missing	11	1.8	1.8	87.2
	not applicable	76	12.8	12.8	100.0
	Total	595	100.0	100.0	

Q23 - Prescribed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	101	17.0	17.0	17.0
	No	494	83.0	83.0	100.0
	Total	595	100.0	100.0	

Q23 - Only drug tried

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	97	16.3	16.3	16.3
	No	497	83.5	83.5	99.8
	Missing	1	.2	.2	100.0
	Total	595	100.0	100.0	

Q23 - Best desired effect

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	350	58.8	58.8	58.8
	No	244	41.0	41.0	99.8
	Missing	1	.2	.2	100.0
	Total	595	100.0	100.0	

Q23 - Cheap

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	317	53.3	53.3	53.3
	No	277	46.6	46.6	99.8
	Missing	1	.2	.2	100.0
	Total	595	100.0	100.0	

Q23 - E/Accessible

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	228	38.3	38.3	38.3
	No	366	61.5	61.5	99.8
	Missing	1	.2	.2	100.0
	Total	595	100.0	100.0	

Q23 - E/Hide

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	90	15.1	15.1	15.1
	No	504	84.7	84.7	99.8
	Missing	1	.2	.2	100.0
	Total	595	100.0	100.0	

Q23 - E/Consume

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	261	43.9	43.9	43.9
	No	333	56.0	56.0	99.8
	Missing	1	.2	.2	100.0
	Total	595	100.0	100.0	

Appendix 56b: Raw SPSS data: Cross tabulations

Q19 - Darkweb * Q7 - Valium Crosstabulation

			Q7 - Valium		
			Yes	No	Total
Q19 - Darkweb	Yes	Count	153	19	172
		% within Q7 - Valium	30.7%	19.8%	28.9%
	No	Count	344	77	421
		% within Q7 - Valium	68.9%	80.2%	70.8%
	Missing	Count	2	0	2
		% within Q7 - Valium	0.4%	0.0%	0.3%
Total		Count	499	96	595
		% within Q7 - Valium	100.0%	100.0%	100.0%

Q19 - Darkweb * Q7 - Xanax Crosstabulation

			Q7 - Xanax		
			Yes	No	Total
Q19 - Darkweb	Yes	Count	163	9	172
		% within Q7 - Xanax	33.9%	7.9%	28.9%
	No	Count	317	104	421
		% within Q7 - Xanax	65.9%	91.2%	70.8%
	Missing	Count	1	1	2
		% within Q7 - Xanax	0.2%	0.9%	0.3%
Total		Count	481	114	595
		% within Q7 - Xanax	100.0%	100.0%	100.0%

Q11anxietycombined * Q1 Age Crosstabulation

			Q1 Age					
			18-21	22-25	26-30	31-40	41+	To
Q11anxietycombined	Yes	Count	128	47	8	5	7	
		% within Q1 Age	30.3%	37.0%	42.1%	45.5%	43.8%	
	No	Count	294	80	11	6	9	
		% within Q1 Age	69.7%	63.0%	57.9%	54.5%	56.3%	
Total		Count	422	127	19	11	16	
		% within Q1 Age	100.0%	100.0%	100.0%	100.0%	100.0%	1

Q11anxietycombined * Q2 Gender Crosstabulation

			Q2 Gender			
			Male	Female	Transgender	Total
Q11anxietycombined	Yes	Count	106	89	0	195
		% within Q2 Gender	32.5%	33.8%	0.0%	33.1%
	No	Count	220	174	1	395
		% within Q2 Gender	67.5%	66.2%	100.0%	66.9%
Total		Count	326	263	1	590
		% within Q2 Gender	100.0%	100.0%	100.0%	100.0%

Q11 - High * Q2 Gender Crosstabulation

			Q2 Gender			
			Male	Female	Transgender	Total
Q11 - High	Yes	Count	224	140	1	365
		% within Q2 Gender	68.7%	53.2%	100.0%	61.9%
	No	Count	102	123	0	225
		% within Q2 Gender	31.3%	46.8%	0.0%	38.1%
Total		Count	326	263	1	590
		% within Q2 Gender	100.0%	100.0%	100.0%	100.0%

Q2 Gender * Q11 - Counteract stim Crosstabulation

			Q11 - Counteract stim		
			Yes	No	Total
Q2 Gender	Male	Count	222	104	326
		% within Q2 Gender	68.1%	31.9%	100.0%
	Female	Count	144	119	263
		% within Q2 Gender	54.8%	45.2%	100.0%
	Transgender	Count	0	1	1
		% within Q2 Gender	0.0%	100.0%	100.0%
Total		Count	366	224	590
		% within Q2 Gender	62.0%	38.0%	100.0%

Q13 - Valium * Q11 - Sleep Crosstabulation

			Q11 - Sleep		
			Yes	No	Total
Q13 - Valium	1	Count	83	42	125
		% within Q11 - Sleep	25.2%	15.8%	21.0%
	2	Count	108	72	180
		% within Q11 - Sleep	32.7%	27.2%	30.3%
	3	Count	39	30	69
		% within Q11 - Sleep	11.8%	11.3%	11.6%
	4	Count	18	13	31
		% within Q11 - Sleep	5.5%	4.9%	5.2%
	5	Count	16	12	28
		% within Q11 - Sleep	4.8%	4.5%	4.7%
	6-10	Count	10	6	16
		% within Q11 - Sleep	3.0%	2.3%	2.7%
	Over 10	Count	9	6	15
		% within Q11 - Sleep	2.7%	2.3%	2.5%
	Missing	Count	20	15	35
		% within Q11 - Sleep	6.1%	5.7%	5.9%
	Not applicable	Count	27	69	96
		% within Q11 - Sleep	8.2%	26.0%	16.1%
Total		Count	330	265	595
		% within Q11 - Sleep	100.0%	100.0%	100.0%

Q13 - Valium * Q11 - High Crosstabulation

			Q11 - High		
			Yes	No	Total
Q13 - Valium	1	Count	47	78	125
		% within Q11 - High	12.8%	34.4%	21.0%
	2	Count	107	73	180
		% within Q11 - High	29.1%	32.2%	30.3%
	3	Count	48	21	69
		% within Q11 - High	13.0%	9.3%	11.6%
	4	Count	23	8	31
		% within Q11 - High	6.3%	3.5%	5.2%
	5	Count	22	6	28
		% within Q11 - High	6.0%	2.6%	4.7%
	6-10	Count	14	2	16
		% within Q11 - High	3.8%	0.9%	2.7%
	Over 10	Count	12	3	15
		% within Q11 - High	3.3%	1.3%	2.5%
	Missing	Count	24	11	35
		% within Q11 - High	6.5%	4.8%	5.9%
	Not applicable	Count	71	25	96
		% within Q11 - High	19.3%	11.0%	16.1%
Total		Count	368	227	595
		% within Q11 - High	100.0%	100.0%	100.0%

Q13 - Valium * Q11anxietycombined Crosstabulation

			Q11anxietycombined		
			Yes	No	Total
Q13 - Valium	1	Count	37	88	125
		% within Q11anxietycombined	19.0%	22.0%	21.0%
	2	Count	69	111	180
		% within Q11anxietycombined	35.4%	27.8%	30.3%
	3	Count	24	45	69
		% within Q11anxietycombined	12.3%	11.3%	11.6%
	4	Count	12	19	31
		% within Q11anxietycombined	6.2%	4.8%	5.2%
	5	Count	10	18	28
		% within Q11anxietycombined	5.1%	4.5%	4.7%
	6-10	Count	7	9	16
		% within Q11anxietycombined	3.6%	2.3%	2.7%
	Over 10	Count	9	6	15
		% within Q11anxietycombined	4.6%	1.5%	2.5%
	Missing	Count	15	20	35
		% within Q11anxietycombined	7.7%	5.0%	5.9%
	Not applicable	Count	12	84	96
		% within Q11anxietycombined	6.2%	21.0%	16.1%
Total		Count	195	400	595
		% within Q11anxietycombined	100.0%	100.0%	100.0%

Q13 - Valium * Q11 - Counteract stim Crosstabulation

			Q11 - Counteract stim		
			Yes	No	Total
Q13 - Valium	1	Count	78	47	125
		% within Q11 - Counteract stim	21.1%	20.8%	21.0%
	2	Count	124	56	180
		% within Q11 - Counteract stim	33.6%	24.8%	30.3%
	3	Count	44	25	69
		% within Q11 - Counteract stim	11.9%	11.1%	11.6%
	4	Count	20	11	31
		% within Q11 - Counteract stim	5.4%	4.9%	5.2%
	5	Count	19	9	28
		% within Q11 - Counteract stim	5.1%	4.0%	4.7%
	6-10	Count	13	3	16
		% within Q11 - Counteract stim	3.5%	1.3%	2.7%
	Over 10	Count	9	6	15
		% within Q11 - Counteract stim	2.4%	2.7%	2.5%
	Missing	Count	23	12	35
		% within Q11 - Counteract stim	6.2%	5.3%	5.9%
	Not applicable	Count	39	57	96
		% within Q11 - Counteract stim	10.6%	25.2%	16.1%
Total		Count	369	226	595
		% within Q11 - Counteract stim	100.0%	100.0%	100.0%

Q13 - Xanax * Q11 - Sleep Crosstabulation

			Q11 - Sleep		
			Yes	No	Total
Q13 - Xanax	1	Count	125	95	220
		% within Q11 - Sleep	37.9%	35.8%	37.0%
	2	Count	78	69	147
		% within Q11 - Sleep	23.6%	26.0%	24.7%
	3	Count	26	16	42
		% within Q11 - Sleep	7.9%	6.0%	7.1%
	4	Count	9	12	21
		% within Q11 - Sleep	2.7%	4.5%	3.5%
	5	Count	5	6	11
		% within Q11 - Sleep	1.5%	2.3%	1.8%
	Over 10	Count	0	1	1
		% within Q11 - Sleep	0.0%	0.4%	0.2%
	1/2 a Xanax bar	Count	8	6	14
		% within Q11 - Sleep	2.4%	2.3%	2.4%
	Missing	Count	16	9	25
		% within Q11 - Sleep	4.8%	3.4%	4.2%
	Not applicable	Count	63	51	114
		% within Q11 - Sleep	19.1%	19.2%	19.2%
Total		Count	330	265	595
		% within Q11 - Sleep	100.0%	100.0%	100.0%

Q13 - Xanax * Q11 - High Crosstabulation

			Q11 - High		
			Yes	No	Total
Q13 - Xanax	1	Count	146	74	220
		% within Q11 - High	39.7%	32.6%	37.0%
	2	Count	110	37	147
		% within Q11 - High	29.9%	16.3%	24.7%
	3	Count	34	8	42
		% within Q11 - High	9.2%	3.5%	7.1%
	4	Count	16	5	21
		% within Q11 - High	4.3%	2.2%	3.5%
	5	Count	9	2	11
		% within Q11 - High	2.4%	0.9%	1.8%
	Over 10	Count	1	0	1
		% within Q11 - High	0.3%	0.0%	0.2%
	1/2 a Xanax bar	Count	10	4	14
		% within Q11 - High	2.7%	1.8%	2.4%
	Missing	Count	15	10	25
		% within Q11 - High	4.1%	4.4%	4.2%
	Not applicable	Count	27	87	114
		% within Q11 - High	7.3%	38.3%	19.2%
Total		Count	368	227	595
		% within Q11 - High	100.0%	100.0%	100.0%

Q13 - Xanax * Q11anxietycombined Crosstabulation

			Q11anxietycombined		
			Yes	No	Total
Q13 - Xanax	1	Count	68	152	220
		% within Q11anxietycombined	34.9%	38.0%	37.0%
	2	Count	51	96	147
		% within Q11anxietycombined	26.2%	24.0%	24.7%
	3	Count	16	26	42
		% within Q11anxietycombined	8.2%	6.5%	7.1%
	4	Count	8	13	21
		% within Q11anxietycombined	4.1%	3.3%	3.5%

	5	Count	5	6	11
		% within Q11anxietycombined	2.6%	1.5%	1.8%
	Over 10	Count	0	1	1
		% within Q11anxietycombined	0.0%	0.3%	0.2%
	1/2 a Xanax bar	Count	3	11	14
		% within Q11anxietycombined	1.5%	2.8%	2.4%
	Missing	Count	14	11	25
		% within Q11anxietycombined	7.2%	2.8%	4.2%
	Not applicable	Count	30	84	114
		% within Q11anxietycombined	15.4%	21.0%	19.2%
Total		Count	195	400	595
		% within Q11anxietycombined	100.0%	100.0%	100.0%

Q13 - Xanax * Q11 - Counteract stim Crosstabulation

			Q11 - Counteract stim		
			Yes	No	Total
Q13 - Xanax	1	Count	157	63	220
		% within Q11 - Counteract stim	42.5%	27.9%	37.0%
	2	Count	93	54	147
		% within Q11 - Counteract stim	25.2%	23.9%	24.7%
	3	Count	28	14	42
		% within Q11 - Counteract stim	7.6%	6.2%	7.1%
	4	Count	15	6	21
		% within Q11 - Counteract stim	4.1%	2.7%	3.5%
	5	Count	5	6	11
		% within Q11 - Counteract stim	1.4%	2.7%	1.8%
	Over 10	Count	1	0	1
		% within Q11 - Counteract stim	0.3%	0.0%	0.2%

	1/2 a Xanax bar	Count	10	4	14
		% within Q11 - Counteract stim	2.7%	1.8%	2.4%
	Missing	Count	16	9	25
		% within Q11 - Counteract stim	4.3%	4.0%	4.2%
	Not applicable	Count	44	70	114
		% within Q11 - Counteract stim	11.9%	31.0%	19.2%
Total		Count	369	226	595
		% within Q11 - Counteract stim	100.0%	100.0%	100.0%

Q2 Gender * Q9 - Prefered benzo? Crosstabulation

			Valium	Xanax
Q2 Gender	Male	Count	139	154
		% within Q2 Gender	42.6%	47.2%
	Female	Count	133	109
		% within Q2 Gender	50.6%	41.4%
	Transgender	Count	1	0
		% within Q2 Gender	100.0%	0.0%
Total		Count	273	263
		% within Q2 Gender	46.3%	44.6%

Q1 Age * Q9 - Prefered benzo? Crosstabulation

			Valium	Xanax
Q1 Age	18-21	Count	187	202
		% within Q1 Age	44.3%	47.9%
	22-25	Count	67	47
		% within Q1 Age	52.8%	37.0%
	26-30	Count	10	5
		% within Q1 Age	52.6%	26.3%
	31-40	Count	5	4
		% within Q1 Age	45.5%	36.4%
	41+	Count	7	7
		% within Q1 Age	43.8%	43.8%
Total		Count	276	265
		% within Q1 Age	46.4%	44.5%

Appendix 57: Benzodiazepines in a recreational context: night-out timeline